Woman Love, should be
like the Sun shone Star:
that has no fellow in the
firmament,

TEXT BOOK

FOR THE

MEDICAL STUDENTS OF JEFFERSON COLLEGE,

ATTENDING THE LECTURES OF THE

PROFESSOR OF MATERIA MEDICA AND BOTANY.

THIRD SESSION.

1827-8.

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OUTLINES

OF

LECTURES

ON

MATERIA MEDICA AND BOTANY,

DELIVERED IN

JEFFERSON MEDICAL COLLEGE,

PHILADELPHIA:

BY WILLIAM P. C. BARTON, M. D.

VOLUME I.

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1827.

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1899.

Eastern District of Pennsylvania, TO WIT:

BE IT REMEMBERED, That on the sixth day of October, in the fifty-second year of the Independence of the United States of America A. D. 1827, William P. C. Barton, M. D. of the said District, hath deposited in this office, the Title of a Book the right whereof he claims as author, in the words following, to wit:

"*Outlines of Lectures on Materia Medica and Botany, delivered in Jefferson Medical College, Philadelphia, by William P. C. Barton, M. D.*"

In conformity to the act of the Congress of the United States, intituled "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned." And also to the act, entitled "An act supplementary to an act, entitled "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned," and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

D. CALDWELL,

Clerk of the Eastern District of Pennsylvania.

INTRODUCTORY ADDRESS

TO MY CLASS.

These outlines are designed to aid the student in the laborious task of taking notes. They cannot, however, supercede the necessity of that useful exercise by which the assiduous shou'd *put in* the lights and shades, (if any *lights* there be,) that the whole view may be as complete as they and I can make it. The sketches here furnished are drawn on a wide *canvass*. They will constitute the leading heads of your notes as well as of my discourse, which being chiefly extemporaneous, requires such a guide. In a word, they are designed to enable the student to direct his reflection on the subjects of his instructor's lecture, to a profitable time-saving issue, by affording brief but useful aids to a facile recollection of all its points; thus leading him to memorize the information he may receive. From these hints he may retrace at his leisure the theme of one lecturer, liable to be speedily effaced, by the necessity of directing his attention to another who follows on a different subject, and thus successively for several hours The sententious disposition of some of the first, and much of the second volume, is adopted for succinctness. It precludes any attempt at good style. This has neither been aimed at, nor must it be expected in a publication, pretending to nothing but truth, candour and usefulness. Truth is its broad basis. It forbids the purloining of the original opinions and practice of others, by decorating them with a new, an imposing a deceptive dress. It forbids the furtive and mendacious appropriation to one's self, of the merit of other writers or lecturers—of their theories, practice or novel application of remedies—by bold but impotent claims to credit for prior conception of either—a species of audacity founded in

a vanity as foolish as illjudged and impolitic—a kind of craft and plagiary, and usurped pretension to learning and fame, evincing as much weakness as egotism—as much shallowness of wit, as that foolish bird the ostrich discovers when he puts his head into a bush, and because he does not see the eyes which are watching him, stupidly imagines he is himself not visible in his trick—a kind of mean imposition on the uninformed minds of the generous and confiding pupils of our schools; and an affront to the riper minds of the profession, when given to their indignant eyes in a turgid and syllabub production claiming to be a sober treatise for their instruction—a line of conduct on the whole view which compromits the honor of such teacher or author, and renders him obnoxious to that merited animadversion of his brethren which should overwhelm any sensitive mind vith humiliating chagrin. If these observations be enigmatical to you, they will not appear so to the profession, to whom the name and work which present a solution of the riddle are imprinted in a *character so conspicuous* that he who runs may read—a circumstance at once the justification of these sentiments, and the severest censure which could be devised of the vaunting conduct they condemn. If they be construed into throwing a gauntlet into the ring of the medical teachers and writers of America, far or *near*, let him by whose feet it closest lays, take it up. He will find me prompt and prepared, to enter the lists with him, and by the issue let the profession adjudge whether the rebuke has been sustained. None other will cast his eyes on such a stake with any other feeling, than to raise them up to him who beholds it at his feet with an aspect at once ridiculous, detected and guilty. Fair play is a jewel. If we fain would, as we fairly may, claim the respect of our *trans*-atlantic brothers of the profession, by our medical literature, we assuredly must do so by the truth, the candour, the justice of our writings—by imbuing them with that inherent claim to the respect and guarantee of our *cis*-atlantic brethren of the profession, which truth and candour and justice alone can inspire—not by filching from foreign authors or from each other, the fame reaped by the sweat of the

mind's brow, and by borrowing the pipe they have handseled, blowing out our would-be authority as teachers and authors into a gaudy, particoloured bubble of soap, which, as soon as touched at home or abroad by the finger of investigation—bursts, vanishes in air or falls to the earth. There, the condensed drop of which the whole inflated volume of gas was distended would not be sufficient by its irrigation or enrichment, to cause a moss to shoot from the extended soil of medical learning.

Thus much for the first pretention of these outlines: candour is their second claim. Relative to this I would observe, the most of what they contain is mere common place information to be crossed in the path of reading on the subject to which they appertain. This is common property; and if acknowledgement is not always made for it, that is because acknowledgement would be a fastidious supererogation in relation to what all know to be the aggregate result of more than half a century's experience and instruction. If facts given to the profession by some of the writers of the day, in Europe, are not coupled with their names, let the unpretending tenor of the work and these declarations, stand a comprehensive concession of the value of their authors experience for which I am ready to acknowledge myself indebted. The merit or demerit of these outlines will consist in the judicious or illjudged advantage I may have taken of my reading. My own opinions and experience have directed the course pursued—and they may be erroneous and uninstructive—If so, it will not have been the fault of a culpable inattention to deep reading; a reprehensible neglect to observe the phænomena of diseases, or physiological aberrations from health; or any nolition to be swayed by the judgment of others; but must be owing to a lack of what alone can render reading or observation profitable, which one's self love prevents one from perceiving, while perhaps it may be as plain to the world as a habit of thinking for myself is known to my own bosom. Traits of this independent balance, between error and credulity, true zeal and its cousin german enthusiasm, with its concomitant effect scredulity and unmerited encomium, will be visible throughout these outlines, particularly the therapeutic volume—I have attempted throughout

to weigh with such just weights as my abilities afforded, the dross of materia medica and therapeutics, against the pure metal; and to sift with as much energy as I am capable of, the shop-dirt from the medicaments. It is on this process that the usefulness of these pages is grounded.

With regard to this, the third pretension of these outlines, I would observe that they have found their way into your hands, with the expectation of being useful to you – That I may not be disappointed in this, is my sincere hope – A sad baulk would it be to one who has no other means which he deems justifiable or creditable, of making a favourable impression on those committed to his surveillance in one part of the duties to be performed by them during the nonage of their profession: to one who thinks the corner stone of good instruction, should ever be laid on the firm basis of usefulness.

If the profession, for whom, by the bye it is not intended, find any thing in the work which they can find in no other, *not even in the late Professor Barton's Lectures*, that magazine of facts and information the plenitude of which has afforded, even by the scanty notes of his pupils, a fruitful source of depredation by marauding writers, why then, that much may perhaps, be considered original, if there be, as I much doubt, any thing new under the sun——in medicine. But I am not at all solicitous on this point—not caring a groat for an adjudication of "original" any thing—seeing it claimed with so much effrontery where it exists not, and the claim allowed to pass as current coin, because no one has been willing to lose, by breaking it to see how far the copper cheat was gilt—and content to shuffle it off with suspicion and distrust to his next neighbour in hopes it eventually would be brought to some bank where it might be cracked in the face of its owner, regardless of his black looks for the loss thus summarily inflicted. With as much knowledge of the subject as eleven years teaching and studying it with unremitting toil, and near twenty years practice of my profession can give me—I am arrived at the conclusion that he is a fool who mounts before his class on the joggling noisome stilts of "originality." Before you I desire no higher elevation than may enable me to see the heads of those of you

who occupy the back bench—and my only ambition is to teach you thoroughly, by fact and demonstration, what I in common with my professional brethren know; and especially what I believe—not, from a prurient vanity to appear a genius of the first water to teach what I do not know, nor they neither, and what neither they nor I can believe. I have no desire to wheedle myself into your attachment, by dwelling on the singular circumstance that I have been born in the same state with most of you—so little marvellous or important do I think that fact, that I shall not perpetually remind you of "our native state"—simply, for want of a better reason, because a man canno choose where he may be born, and may perhaps lecture quite as well, and certainly more to the point, without such tender reminiscences. I have no desire to court popularity with you by this or any other trick—because I despise popularity, as such, secured in any unworthy way. But, if unambitious of this courted balm to the insincere and meritless heart—if I would not leave my duty to you to take a precarious crusade after that shadow popularity—still I am ambitious of the substance—very ambitious to deserve your respect, by doing my duty. A part of this will be to test your industry by public interrogation with unsparing severity for your good; disdaining the indignity to you, or my own self respect, by "*quizzing*" of any kind *per alium* or *per se*. In other words scorning to trifle with your golden but fleeting hours, by venal, undignified prostitution of my relative standing with you, or a culpable expenditure of my time and character, by grinding your wits for an additional fee into a knowledge of a subject, all I know of which I feel myself bound, by the contract of our ticket-fee to teach you, without further toll or gift. These latter observations you may receive from me as an epitome of the policy to be pursued by all the Professors of Jefferson college, so far as regards their duties as teachers. It is a just and equitable policy—and not the slightest degree of credit is claimed for adopting it. They have seen another less equitable course pursued—They have watched its effects—they have deprecated it—deplored the strong-headed folly, equalled only by the patronage of quacks, which originated and fostered it: yet *they* have been the

gainers—for to that ill judged policy with all its collateral grievances is altogether owing, the existence and chartered rights of our new, our rising, and our flourishing school. A school which forgets every thing but its just objects and its duty—its rightful direction by the out-door opinion of the aggregate disinterested profession of the State and the United States—a school, extending to our celebrated sister school, the University of Pennsylvania, directed as it is by some of the best talent in the country, the hand of amity, honor and concert in the same pursuit of instruction. We hope by this unharmful conduct, which it shall be no fault of ours if interrupted or infracted, to secure to the city favoured by a host of advantages for medical instruction, unequalled in any city of the Union and not surpassed by any in the world—the chief direction of medical education in the United States. We believe that many of the too numerous schools in less favoured places, must eventually be broken up, not from want of talents, but from want of the adventitious means of giving them due effect. We already perceive the beginning of this issue in some institutions; we will therefore endeavour, by adding to the rich means of instruction here, to profit by the inevitable result, though we shall not rejoice, nor would be suspected capable of such wantonness, in a course of things which will flow out of mere local advantages.

Whatever have been the errors, and it is not denied that some have existed, in the administration of Jefferson College before its charter by the legislature—they have been the errors incident to an enterprise of magnitude, achieved and carried straight forward, in despite of unexampled opposition, both fair and dishonourable, which the interests and passions of men suggested. Whatever they have been—whatever policy they had led to, not fully justified by the profession—those errors no longer exist, and that policy is radically changed. A fair, an honourable, and an amicable competition is adopted with the University—and a fair an honourable and an amicable competition, has been declared to me by one of the most eminent trustees of that school, (I believe as the sentiment of its board,) was not in any way offensive, or objectionable to its public sense of duty. I am prepared to declare, that when the policy now

rigidly adopted shall be changed, which I trust and believe it never will, for one, I shall cease to be a member of the institution. No fears need be entertained, however, of such change in its course. It is under the control of an able, an intelligent, a dispassionate and purely disinterested board of trustees desirous and legally authorised, by prompt and decisive measures, to rein in the slightest aberration from the legitimate objects of their trust. Their zeal and activity is commensurate with their high trust—and this is evinced in their causing to be erected a large, an elegant, and a fit building, now begun on one of the most central and suitable sites in this city for the accommodation of the classes. In this fabric, fitness, accommodation,* durability and elegance will be looked to—the funds, supplied by some of the trustees and citizens, are ample and prepared, and the artificers able, and among those who have adorned the city by the beauty and appropriateness of the public edifices they have erected. It is contemplated to be under roof by the new year, and at all events, completed by the succeeding summer. The students of the United States therefore, are invited through you in good faith, because of the superior advantages you can attest do really belong to our city, to resort to it for their instruction—where either of the two schools as they shall elect, may justly boast of facilities, equally enjoyed by both, and under what we conscientiously believe an aggregate equality of talent.

We claim one advantage, as teachers, over any who may not possess it—and for the honor of the whole profession, and for its reputation abroad, we are chagrined to have, by the conduct of any, the power of claiming it—none of our teachers have blazoned the armorial bearings of their profession, by becoming SUPPORTERS, *proper*, to the brazen shield of empiric ignorance and upstart impudence. The escutcheon of our honorable calling, quartered as it is by the insignia of an institution the object of which is to *promote* medical science and learning, is not smirched by that blot—does not, in in the broad face of day, in daily news-papers, and hand-bills posted with the

* The lecture-rooms will be 47 feet square—the largest in the University, is 45 by 50 feet.

advertisements of strayed cows and the pedigrees of horses, in every tavern throughout the country, present the shameless, indelible, unretracted misdemeanour, of thrusting, by unparalelled folly, our names with the adventitious influence of protessional exaltation and high office, into the astonished countenances of our brethren—does not, by the infraction of all decorous behaviour, strike at the reputation and raze the professional foundation of subsistence and business, of those beginning to receive. or confirmed in the deserved confidence of the community—does not crush the youth, aspiring to the requisite knowledge of learned distinction in his art, by the prostrating club of a Hercules wrestling with a many-headed monster. We have never done those deeds, which can forcibly, meritedly, subject us to the application of a certain homely but true proverb, that has more than birds for its gist!!! When we do so, we ought to be expelled, and I trust will be expelled by our trustees, as unworthy of our trust——and as having dishonored our profession—a profession, which I take the bold stand of averring, does not contain one single respectable member from one extremity of the United States to the other, who does not with his heart and hand subscribe to any rebuke he may gather from the devices of this heraldry.

The profession has long waited for a retraction of an affront to its dignity, *unique* in its nature, intolerable from its injustice, unexampled for its folly and indefensibleness. Longer it ought not to await the apologetic grace, though atonement it can never yield. of a public recantation. The want of such appeasement for an outrage so flagrant and sinister, renders the professional escuage assumed in these strictures, in which apophasis is not aimed at, entirely justifiable. It has been called for, till the offended are hoarse from calling. The armour worn by their champion is forged out of the hard stuff of their grievances—and, though he may thus render himself a target for the shafts both openly and secretly directed from an Iscariot band—still, caparisoned as he is in mail rivetted together every link, by the thousand hammers of the profession, those shafts must recoil on that band, empoisoned by the juice of their own Upas.

TO THE

MEDICAL PROFESSION,

IN THE

UNITED STATES.

It has been stated, that this work is not designed for the Profession—that it has no pretensions, other than already stated: but it gives me great satisfaction to inform my Medical Brethren of the United States, that I possess, and will forthwith publish, a work on the same subject, of exalted pretension; of the strongest possible claims to sustain that pretension, and their extensive, nay, I venture to believe, their universal patronage. I mean the MANUSCRIPT LECTURES of my late uncle Dr. Benjamin Smith Barton, for more than twenty years Professor of Materia Medica and Botany; and two years Professor of the Practice of Physic and the Institutes of Medicine, in the University of Pennsylvania: an institution which confessedly owes much of its reputation and celebrity to his long exercised talents, as one of its most gifted teachers.

To all who know—and all who know any thing of the Medical History of our country, do know—the genius, the industry that ceased only with his life, and the learning of that great man, compared with whom, viewing him on the zenith as he is, many of us who are now teachers of medicine and especially we who are writers on Materia Medica, are in the nadir of the sphere of learning and science—all who know this will receive it as no incredible declaration, that a work of greater erudition on any subject, could scarcely be expected from the pen

of any one man. It will be found a work not issued from the press in the exuberant pruriency to keep out of view the labours of his predecessors, after its author "had delivered *three* courses of lectures on this science," not the work of one "very unexpectedly called to teach the Materia Medica in the University of Pennsylvania," who had "entered on the enterprize with none of the advantages which would have been derived from the previous study of the subject with this precise and definite view"—not the production of one who "was pressed by the class" (nor twenty-one classes) "that had formerly attended him, with an earnestness which he could not well resist, to prepare a work on the Materia Medica, or in other words to print his lectures"—it is not such a work, of such an one, *goaded against his will* to hazard his reputation by premature publication even by *reluctantly* yielding to the irresistable solicitations of those endeared to him by attendance on three courses.

But it will be found a work deliberately prepared for the public, in the last years of his life, by one who entertained elevated opinions of what a man should issue from the press, who might derive, or expect to derive solid reputation by his work—of one who after six years previous devotion to the study of Botany and to teaching it in the University, devoted upwards of twenty years study, reflection, and practice of his profession, with annual, monthly, nay daily important additions and revisions, (as I can attest from observation during my pupilage with him,) to render his lectures worthy of the public eye—a work enriched by the toil of the midnight closet directed by the best talents. In short it will be seen to be the work of one, who, in designing it as a publication of authority and erudition, did not reckon without his host—a work which *must* create imperishable fame for the memory of its gifted, and its better than gifted, its learned and toilsome author. while it will shew by comparison, the nothingness of such works as owe all their merit to furtive surreption—will unquestionably, constitute for the profession, a rich source of information, and a depository of important facts. Can it be otherwise, being the result of the

concentrated labours of a moiety of a life devoted to acquiring a thorough knowledge of, and full qualification for teaching the subject to which it pertains? It embodies more facts than, in the course of my life's reading, I have met in catenation on any single subject—besides being enriched by the result of the observations of the eminent practitioners of this country.

Such are the MSS. of Dr. Barton*—I have rescued them from oblivion, if not destruction. I have done so, because I felt it a duty to the medical profession of our country—to give the rich contribution to our medical science; and above all, because I shall have been the instrument of executing the last wish of their illustrious author, from whom I received on his death bed, a declaration in the last words I heard him utter, that he believed they would give honour to his memory and the name;

* I trust I possess sufficient candour, and sufficient judgment of the subject, to give a correct opinion of the intrinsic value of these writings; and to preclude the idea that any interest in this property could compromit the one, or warp the other, in the above estimate of their importance. As there are some, however, whose reputation is involved in suppression or publication of the MSS. and who would not hesitate to circulate the idea, that such personal interest had swayed me to overrate their excellence. I subjoin an extract from my life of Dr. Barton, written and published by appointment and request of the Medical Society of this city, (which published their declaration of the faithfulness of that essay)—written at a time I did not possess, nor ever dreamed of possessing, either the MSS. or any the least personal interest in them.

"To this chair of materia medica Dr. Barton was shortly after appointed, being then but just turned of thirty years of age, and having been professor of natural history and botany near six years. And here, gentlemen, *begins* and *rests* the high professional reputation of Dr. Barton in medicine. To the important lectures on this subject, continued by him till the period when the loss of one of the great pillars of this medical school afforded him an opportunity of a translation to the vacant chair of the practice of physick, is entirely attributable the present conspicuous elevation of the materia medica professorship in this University. Those who have attended the lectures of the late professor on this point of medical science, can bear honourable and powerful testimony in favour of their importance, their learning, their usefulness."—Feb. 1816.

and that they were the only writings of which he desired a posthumous publication. I hold the sacredness of such a wish of such a man, inviolable. And since it has, by an extraordinary and unlooked for course of events, fallen to my lot to possess them as my own property, with a full right to preserve, burn, or publish them, I seize with avidity on the first favourable opportunity of giving them to the public—though I was never destined by their author to inherit nor edit them—nor any the least valuable of his Manuscripts. Never till I purchased them did I possess one line of his writings, save his letters to me and my father. Were I without any other motive however, the single fact of my being a public teacher of Materia Medica in a new and rising institution, would impel me to the course I have taken; having too much regard for solid reputation, to retain unpublished lectures on the subject I teach—well assured, that a man who cannot by his individual exertion, sustain his own reputation and that of the school he belongs to. so far as those individual exertions have any thing to do with it, without the borrowed aid of the unpublished labours of another, is unfit to be trusted, and unworthy of his place. These MSS. were left by Dr. Barton, (after being prepared by his own hand for publication, with directions to the printer for arrangement) to his son Thomas Pennant Barton, Esq. who with proper filial respect, parted with them to an eminent Bookseller of this city, whose subsequent misfortunes led to their suppression. The MSS. bear the printers' marks of having been composed to the extent of a form or two. I never saw these lectures since I was a student with their author, until within a year past, when I accidentally learned they were under the counter of a store-keeper in the lower part of the city, where they had been for some time, among his dry-goods. I did not hesitate to purchase them of him, without any idea, from the manner they had passed into his hands, they could be complete, for a sum, which, considering the risk of mutilation, was considerable. My engagements last winter in delivering my first full course of lectures on Materia Medica and Botany, in Jefferson College, deprived me of the leisure of arranging

rendering legible, and perusing these valuable MSS. This was the toil of three months of the last Spring. When it is recollected that they were chiefly written on small pieces of paper, backs of letters, covers of pamphlets, proof-sheets, his son's college exercises and copy-books, and even small pieces of pasteboard, snatched up at the moment a fact occurred worth recording, were smoaked, torn and dirty—this work will not appear an inconsiderable one. It required perseverance and toil—much of the MSS. was washed free of dirt in water, trimmed, pasted and pressed, and finally arranged by the paging of the authors own hand and by his different directions to the printer. Within a month or two past they have been completely bound and form twenty-four volumes, *without the loss of a single material word.* They are in a more completely legible condition than they ever were: and I shall be happy to exhibit them to any of my medical brethren who desire to inspect them. By the printers calculations, who had counted the words in each lecture, (a labour very necessary in MSS. written on pieces of paper from the size of two inches by four or five, to half a sheet) it appears that the aggregate words in the MSS. amount to 482,640 and will make 1050 large closely printed octavo pages in small type. According to the common plan of printing English medical works they would make from eight to ten octavo volumes.

These lectures embody every thing known relative to the subject of materia medica and therapeutics, up to the period of Dr. Barron s death, having received numerous additions after his translation to the chair of the practice. Eleven years have elapsed since his demise. In order therefore to add the result of this periods improvements in the science of materia medica, I have collected all the important knowledge of the past eleven years, which I propose to add, as a supplement, containing a digested view of the science since his death up to the period of publication. If the profession shall deem me competent to this task, the work may be fairly tendered to their patronage, as a rich system of materia medica, calculated to meet atl the expectations which may be formed of its value.

It is contemplated that the supplement will contain 150 or 200 closely printed pages. The whole may therefore be comprised in three volumes of 400 large closely printed pages in small type. I have only further to add, that I am prepared dispose of an edition, equal to supply the demand of the United States and Europe, retaining the copy-right myself, to any Booksellers in Philadelphia, New York, Boston or Baltimore. The work to be put to press forthwith, and printed in this city under my own supervision. As an inducement to the trade to undertake the work, it is quite fair to remark, that the attachment of Dr. Barton's pupils to him, chiefly grounded on the value of his instruction, renders it probable that few physicians educated in the University of Pennsylvania between the year 1794 when he was appointed Professor, and the year 1816 when he died, will decline to possess themselves of a copy—and his fame in Europe, especially on the continent, will render his work eagerly sought after there. Added to which will be the common chances of sale, and my own annual patronage of the work, in the College where I teach the subject it treats of.

Having, for the information of Book-sellers made these facts known, I have only to observe that I shall prefix a re-print of my biography of Dr. Barton, now out of print, to the work, and afford a model of the best likeness extant, for an engraving. I need but further remark, that to my medical brethren of the United States, I shall be obliged for their patronage, and I cannot but believe that every physician educated in the University of Pennsylvania, during the period of his instruction, will possess himself of the work.

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SYNOPSIS

OF A COURSE OF LECTURES

ON

MATERIA MEDICA AND BOTANY.

Preliminary lectures discussive of as much of the history of the subject, as may be essential to the elucidation of the course; and showing the intimate connexion of the principles of Botany with the Materia Medica—The proofs of this connexion deduced from the steps of discovery of the vegetable medicines, following the tracts of botanical researches; and the confusion in the vegetable articles without the perspicuous and discriminative language of Botany, &c. &c.

The subject divided into,

A. Materia Medica proper.

B. Moral regimen as a therapeutic agent.

C. The influence of such physical causes as may be therapeutically applied.

D. Such as may be resorted to as prophylactics.

E. Restorative dietetics.

F. Toxicology.

G. Botany.

A. Includes introductory discussions on the means of ascertaining the virtues of remedies:

the action of medicines on the body, and the mode of their operating,—the application of the principles of medical chemistry and medical botany. The natural history, systematic classification, botanical and chemical characters and properties, synonymes, demonstrative elucidations, medicinal properties and effects,—of all the articles legitimately recognised as medicines of repute and efficacy. Their doses, pharmaceutic preparations, peculiarities of operation in idiosyncratic constitutions: their therapeutic application sustained by copious practical illustrations. The articles are considered under a divisional scheme, less extended and more simple than the usual division by writers on the subject. The classes are expunged, because it is believed they cannot be claimed as comprising articles of such specific effects as each class itself would imply and require.

B. Comprises a philosophic investigation of the vast assemblage of neglected moral remedies, or restoratives, acting on the physical constitution through the intervention of the moral attributes of man. A scrutiny of the influence and effects of the passions and emotions and of religious and political temperance, in curing, or aiding in the cure of diseases. The necessity of a study of these, in their varied inflections towards and transmutations into other passions and emotions of greater or less sanative effect, in order to be possessed of the judicious command of their remediate powers. The

influence of temperance and intemperance of whatever kind, vices, habits, and necessary occupations of life, on the general system, leading to a consideration of the manner in which these, or most of them, may usefully be enlisted as therapeutic agents. Illustrations and proofs adduced from savage and civilized life, from the histories of military campaigns, naval enterprises, and the pacific attitude of national, sectional and municipal governments. The sanative effect of certain public and private amusements considered in therapeutic view. The genial influence of music, on valetudinarian constitutions, considered: the invigorating and curative power of its practical exercise illustrated and proved. The like influence of the higher spheres of belle-letter exercises, on the disordered systems of the talented and gifted, investigated. The tonic and curative power of certain oral and vocal practices, proved by practical illustrations and facts. In a word, an attempt made to prove that the physician too often resorts to the materia medica, proper, for his medicaments, instead of drawing largely on those kinder and more grateful, and equally curative remedies, which a reflective scrutiny of the moral condition of his patient, and his susceptibility of moral influence, would place at his disposal.

C. Under this section two surveys are taken of physical causes: *a.* in relation to their influence on the moral disposition of man, thus indirectly or

remotely acting with sanative and curative effect, on the disordered corporeal system. *b.* In reference to their direct agency by palpable influence, on the diseased constitution. In the subsection *a* their approximation to moral influences is pointed out. These causes are the changes of the seasons, the transient conditions and vicissitudes of the weather, and their vexatious discomfitures; customary and therefore unnoticed exposure to heat, cold, moisture, and electric aridity of the air, operating imperceptibly, on sensitive constitutions through the associative mental powers, or through the dissociative freaks of capricious minds on the temper and disposition of the individual, and consequently on his corporeal frame. They are to be found also in the same customary and unnoticed exposure to varying temperatures in apartments at home or abroad, during the hours of business, pleasure or pastime: all modified by the sex and age of the patient, by his nativity to the soil, or his foreign birth and usages, and in the latter case by his greater or less approach to entire acclamation; finally, in every instance qualified by the tranquil state of mind usually accompanying competency of the necessaries of life. These indirect physical causes, affect chiefly the constitutional temperaments of keen-passioned and intellectual subjects; the phlegmatic and unlearned, escape their influence. As they manifestly exert no inconsiderable controul over the performance of visceral

functions, they may, by a close attention to their peculiar influence, be brought to operate remediately, according to circumstances attending, and the peculiarities and propensities of the individual under care or advice. Like poisons, which under rigid and experienced controul, are the best medicines, these indirect physical causes, can be therapeutically directed or applied.

The subsection *b* grasps at all those direct physical influences to which the healthiest frame is in some degree subjected, but which especially direct their energy to the weak points of the constitution, and creeping stealthily, but surely, into the inmost recesses of the animal frame, exert either an energetic sanative agency, or a pernicious and fatal influence, according as they are received on guard, or unwarily surprise. The therapeutic application of these direct physical causes, presupposes the indispensable knowledge in the physician, of their noxious, as well as salubrious effects, and the multitudinous changes rung upon the full-toned system, by the endless vascillations of their perpetual moving spring and power. Such knowledge the discussions on these points, aim at communicating to the student.

The outlines of these great and physical agents may be drawn briefly by enumerating,

1st. And most essential, exercise;
2d, Diet:
3d, Dress;

4th, Bodily evacuations;
5th, Natural rest;
6th, Celibacy and marriage.

The first is considered as a Herculean remedy, and is noticed in all its different kinds, under the effect of change of scene, location, time, and climate;—sometimes necessarily affected and modified or altered in salubrious efficacy, even by a change of existence under a form of government more genial to the political temperament and views of the individual. In the division of exercise, the different kinds of gestation are considered in reference to their peculiar efficacy;—sea and land journeys, gymnastic exercises, and the manly sports, bodily labour as exercise, and the playing on musical instruments which require exertion, with the same view.

The second is diet; its sufficiency, inordinancy and regularity in the time of repletion considered —its liquid and solid proportions.

The third physical agent is dress: its necessary, but neglected aptitude to clime, season, and vicissitudes of weather, therapeutically inquired into. Connected with it, and consentaneous with its effect, personal cleanliness, by ablution, and different kinds of bathing, swimming as uniting ablution and exercise. Dress here considered as participating also in a moral influence, thus healthfully aiding its physical agency. Its restorative and invigorating effect on the system through the medium of the taste and

the fancy noticed ; also its peculiar influence on the chronic complaints of children and young persons. An attention to this subject proved to be important from the records of naval and military discipline, and by practical illustrations, derived from the lower and highest orders of society.

The fourth view extends to the curative powers of regularity in obeying or coaxing the natural digestion and evacuations of the body ; by overcoming torpor. or sluggish action of the chylopoitic viscera, shewn to act curatively by the associative actions of the mind ; and conversely, injuriously and perniciously, by indulging in the dissociative actions ; or discomposing and distractive passions, emotions, propensities and occupations. The effect of sea voyages and land travelling, in promoting or retarding these associative and dissociative actions influencing the body. The effect of bodily purification and dress as adjuvants to the therapeutic agency of regular alvine and cystal evacuations. In short, the combined effect of physical and moral causes in relation to the point considered, and proved to go hand in hand.

The fifth, insists on the curative efficacy of judicious quietude of body, and respite from mental and corporeal labour; and the quantum of healthy sleep, to be measured as a medicine, by a scale graduated to the peculiarities of the system, and existing condition of the patient. An endeavour made to shew, that, with this, as other physical causes,

neglect of, and familiarity with its influence, have passed by its curative powers, to get the more readily to the absolute medicaments of the materia medica.

The sixth, enquires into the diseases prejudiced or benefited by celibacy and marriage. The temperament of the individual necessary to be circumspectly scrutinized, before either can be pronounced as a remedy for valetudinarian debility or disorder, or for paroxysmal acute disease. The country, clime, government and laws, and above all, the individuals predisposition to hereditary mental or bodily taint, necessary to be well known, to justify a strenuous recommendation against the will of the patient, to either of these remedies. In a word, the moral temperament, education, and habits of the patient, greatly affect the curative powers of celibacy and matrimony, in such diseases or disorders as they are supposed to cure or restore.

D. This section comprises as much of causes noticed under C, as can be used to guard against the attacks of endemial or epidemic diseases. The stimuli which act on the irritative actions: prophylactic diet, and beverages; dress, gestation, gymnastic exercises, bathing, balsamic odours, etc. etc.

E. Most writers and teachers have divided the materia medica into two main divisions: aliments and medicines; the first embracing things denominated nutrients, having the power of nourishing the

system and supplying its solids and fluids with their requisite pabulum. It is not difficult to see the inconvenience of this division. Many of the articles of diet, as tea and coffee, are, strictly speaking, subjects of the class nutrientia, yet they possess decided medicinal and even narcotic powers. Aliments have been considered, in reference to their easy or difficult digestion; or, as they are called to supply solid or fluid parts of the system; or, as they furnish a large or small quantity of nourishment. In either of these views the arrangement of such nutrient articles under the subject which professedly treats of the medicinal articles, is objectionable. Hence E, comprises a history of those dietetic substances, only, natural or artificial, which are peculiarly suited to the restoration of convalescents; and thus stand midway between aliments and medicines. The peculiarity of their effects pointed out; the necessity of understanding the culinary processes used for preparing them for use, insisted on. In short, as much of the essential part of nutrients treated of, as physicians ought to know, or at least, as students can be supposed to acquire.

F. Comprises a history of poisons, with a development of their effects on the animal functions. The symptoms produced by them, when peculiar or specifically induced, considered. An enquiry into the existence of antidotes, considered as agents endued with specific power to counteract the nox-

ious effects of poisons, and by that specific agency to reinstate the perverted or injured functions in their physiological regularity. An attempt made to reduce the reputed antidotal remedies, to a limited number, capable, under various combinations and circumstances, of opposing temporary suspension to the dangerous inroads of poisons, until they can be removed altogether, by mechanical or medicinal means. A unity of proximate principles proved to exist in many of the plants termed poisonous; and a similar unity shewn in those reputed as the antidotes.

G. This section embraces as much of the principles of terminology and classification, natural and artificial, as is deemed subsidiary to the immediate acquaintance of the student with Materia Medica; in other words, the principles and details of Medical Botany, so set forth, that an amalgamation of them with the details of materia medica proper, so natural and useful, will be found easy to the student.

A.

Subsection a —means used to ascertain the medicinal virtues of substances.

1. Chemical examination, how far to be relied on, when most fallible, and the sources of this fallacy.

The utility of chemical analysis assailed by the celebrated Mariotte more than a century and a quarter ago, on the ground of the existence of the same principles in medicinal and poisonous plants; affected also by the experiments of the Abbe Fontana on the venom of the viper and gum arabic, which yielded the same chemical results. The deception of those views, their inapplicableness to the point discussed. The present mode of investigating by chemical analysis, highly useful, developing the proximate principles of plants. To chemistry is owing the pharmaceutical adaptation of menstruums of appropriate powers, in solving the virtues of medicines and conveying them into the system by adjuvant vehicles.

2. Botanical affinity is that similitude found to subsist, between vegetables that are distinct from

each other, in the parts of their fructification. The analogical structure of plants to each other has given rise to adjudging the possession of analogous virtues. These affinities most to be relied on in the natural families of plants, in which not only the outline characteristic of features, is preserved throughout the various genera grouped under these natural families, but, a coincidence of anatomical structure and physiological office observed, throughout; a similarity in the peculiar juices, of the secretory vessels, and sometimes even the geographical range of habitation, indicative of analogy. Botanical affinity considered under these extended views, is to be relied on: the exceptions rare and anomalous.

The different natural orders, or natural familics, which are pervaded, throughout, with the most striking physiognomonical and anatomical similitude, noticed; and an enquiry into Decandolle's opinions on the deduction to be made in reference to their medical virtues, from these data. These enquiries predicated on our actual experience of coincidence in certain orders or families, and the medicinal virtues of all the species of the genera pertaining to those families. They are pursued also with the intent to aid the student in prosecuting the analysis of the American Materia Medica.

3. The sensible qualities of the substances employed, have likewise been a fruitful criterion for adjudging the medicinal virtues. Fallacious in the extreme, in many instances, yet in a majority leading to judicious results and investigations.

4. The absurd doctrine of signatures, now totally disused.

Definition of the doctrine of signatures or resembling tokens, and illustrations of it. The history of this doctrine, in the writings of Porta, an ital-

ian botanist, who flourished in the sixteenth century. The vestiges of its hallucinative dogmas still before us, in the names of many officinal and other plants; for example: Dentaria, tooth-wort—Pulmonaria, lung-wort—Euphrasia, eye-bright—Hepatica, liver-wort, &c. &c. Evidences of a taint of this doctrine perceivable in the latin work of Schoepf, as late as 1787; as well as in many anonymous publications of physicians, on the virtues of vegetable medicines.

An enquiry into the causes which have retarded the investigations of medicines, generally.

A particular enquiry into the causes which have retarded the investigation of the Materia Medica, of the United States.

Subsection β.

An attempt to point out the confusion which has arisen in the Materia Medica from the neglect of synonymes; and the caprice of authors, in prefering one name to another, without adding and perpetuating the synonmyn by which the article he designated was known to others. The depreciation of medicines of value, in the estimation of practioners, traced often to this source; and to the inevitable substitution of one article for another, owing to confusion of names.

Subsection γ.

General considerations on the constitutional, moral and physical causes, and modes of liv-

ing, which modify the established doses of medicines, in numerous instances. The necessity insisted on, of being alive to all those qualifying and exasperating influences, in order fairly to obtain the medicinal value of any substance of the Materia Medica.

Subsection δ.

The alphabetical order used in preference to the common method of teaching and writing on the Materia Medica. Reasons of this preference detailed from the following outlines:—

A long course of study of the Materials of the science, has fully brought to my view the endless anomalies, paradoxical assumptions, and contradictory results, arising from any attempt to classify the articles termed Materia Medica, by any of the commonly adopted systems.

Bœrhaave arranged the numerous Medicaments according to the order of his botanical system. Linnæus followed the order of his sexual system throughout his Materia Medica. The injudicious nature of these arrangements proved, by an exposition of the discordant materials brought together. Dr. Murray in his Apparatus Medecaminum, followed the order of botanical affinity. Instances of heterogeneous articles brought together under this system, by illustrations from all the orders.

The arrangement of Cullen, that one, which of all the attempts at scientific classification, is the most highly wrought, and carefully digested, produces perpetual discordancies of theory and practice: of data and results; of assumed discipline and insubordinate irruptions into the ranks of division—

in a word, they produce a distracting embarassment in the students' mind and memory ; and, unless he be wary indeed, will taint his practical views, with ill-digested and perverted ideas of the power of the remedies he is to use. The revised system of Cullen by the late Professor Barton, considered, and shewn to be obnoxious to the objections presented by the first outline.

A consideration of Dr. Young's sectional division into chemical, vital, and insensible agents: and subsectional classification into those causing permanent, partial and transient action ; and those that primarily, and secondarily diminish action or sensation ; and finally, those which are absolute specifics.

The utter incompetency of this apparently sufficient and certainly beautiful arrangement, to meet all the exigencies of the distracting materials it is intended to group and generalize, fully shewn by illustration. The terse and comprehensive, and also beautiful, because brief system of Darwin, inquired into ; and its like inaptitude to grasp at all the projecting angles and irregularities of the code of medicaments, proved.

The classification of Dr. Murray into general and local stimulants ; chemical remedies ; mechanical remedies : with the subsectional division of the general stimulants into diffusable and permanent, seems at the first view, to be as nearly unexceptionable as any scheme of classification which could be devised. It doubtless, is so, taking into view the present state of medical science. It has been adopted, by a late writer* on the elements of Therapeutics and Materia Medica. The order has been disadvantageously perverted, though

* Dr. Chapman.

the principles of Murray's classification are pursued, with the exception of an insulated position for mercury. It is evident that the author of that work, is not satisfied with the existing systems of classification; and intimates in the preface of the first edition, that the plan proposed by Dr. Bibb, in 1801,* of arranging medicines on the principle of their affinities to the several systems of the body, is much more natural; and if opportunity is even offered him, he will attempt to establish that system. Bibb's system is predicated on the arrangement of a system by Dr. Rush—his proposition is objectionable; more so than Dr. Murray's—reasons detailed in the lectures. Dr. Granville's arrangement has been adopted by Dr. Eberle in his Elements. In a word, as none of the published systems meet my views, for correctness and truth, it only remains for me to notice one, long since discarded, which I shall endeavour to revive in these lectures.

Newman and Lewis proposed an alphabetical arrangement. This, with some variation relating to the different parts of the plant, was adopted by Alston and Vogel. It is likewise used in Dispensatories, and in Paris' admirable work, the Pharmacologia. I adopt the simple arrangement of the alphabet in these lectures. I discard all the systems of classification just noticed; but, after treating fully of every article under its proper literal head, shall reduce the whole by tabular disposition, according to the most prominent properties they evince, to the system of Murray, of general and local stimulants, chemical and mechanical remedies.

The object of lectures is to inform the student of the history, virtue and effects of medicines. The

* See his printed Inaugural Thesis, Un. of Penn. of that year.

method which enables him to acquire these points of knowledge with the least distraction, and the most certainty ; is, without doubt, the proper method. Eleven years habit of teaching the Materia Medica, has assured me of the total inutility of the common methods of arrangement in teaching ; and the never-ending perplexities encountered by the student, owing to the repeated returns of the same article into the lecturers discourse, for some virtue or effect possessed by it, besides that for which it had already been classed and treated of. The pupil tires and is perplexed, the teacher flags at perceiving the weariness and confusion of his tyro, and mutual embarrassment ensues. The alphabetical method is, to speak without figure, as clear as A. B. C.; never burthens the students memory by a repetition of any call on it by the same articles ; and encourages him by a reflection on the fact, that when the teacher leaves the discussion of any article of the course, *he is done with it.* When he desires to refresh his memory by his notes, they too have a unity of subject in consonance with the singleness of his teachers discourse.

Subsection 5.

The preceding objections are not to the terms used to designate the properties or operation of medicines, as emetics, tonics, &c. but to the feasibility, consistently with fitness and utility in teaching. of arranging the medicaments of the Materia Medica, under classes designating such emetic, tonic or other effect, when in fact the substances so classified, are endued with manifold effects, re-

quiring their insertion in like manner in other classes.

In order to the clear understanding of the terminology of the science of Materia Medica, (for terminology it may with propriety be termed:) I shall enter at once into a therapeutic general lecture on each of the classes designated by this terminology. These therapeutic lectures properly precede the alp abetical disposition and consideration of the medicaments themselves.

Subsection 8.

GENERAL STIMULANTS.

An enquiry into the nature and effect of a stimulant; the grounds on which it is so denominated; the physiological subserviency to its impulses, and permanent or transient susceptibility of its impressions. In how far a stimulant impulse may be considered within the compass of the healthy performance of functions —when the approach of stimulant impulse to dangerous or fatal disproportion to the powers of life commences—how this point of jeopardy is guarded or entrenched by habits, idiosyncracy, or neutralized by counter stimulants applied to less dangerous parts of the system.

Subsection 9.

LOCAL STIMULANTS.

A consideration of what they are; in what they may legitimately be distinguished from stimulants of

a general character; the circumstances which may convert the one into the other considered. The period of life, the state of the system, the sex and occupation or habits of the patient, which all together conspire, or separately tend to modify or change. the impetus, force, and permanence of local stimulants.

The danger of employing them without reference to these circumstances.

The necessity of a knowledge of the principles of elementary and medical chemistry, in order to lead to a knowledge of the incompatible substances improper to be administered with the chemical remedies as refrigerants, antacids, lithontriptics and escarotics.

The utility and importance of a knowledge of the anatomy and physiology of the viscera, to understand the art of prescribing the mechanical remedies with propriety and effect.

OUTLINES OF THE GENERAL THERAPEUTIC LECTURES.

ANTACIDS.

Remedies endued with the chemical neutralizing power of correcting the undue, if not morbid presence of gastric acidity. They act healthfully by producing an innoxious compound within the living system, which takes place of the morbid cause of disorder, existing from the presence of a hurtful agent. Their action is chemical, and, owing to the same principles of neutralizing union inherent in their comminglement out of the body. A disengagement of carbonic gas from the stomach, occurs by the use of any carbonated alkali, as an antacid; and the neutral salt produced in consequence of the administration of any antacid, is purgative or otherwise, according to the agent employed; highly necessary to advert to this fact, in the use of remedies of this power;—since gastric acid disorder, is accompanied by the two opposite states of the bowels: wasting laxity, and flatulent, painful constipation. In the latter case lime used for its antacid property, as is common in form of lime-water, would aggravate perhaps, and certainly not remove the evil—while the neutral salt produced by exhibiting magnesia, would purge, and vice versa. Whether gastric acidity be induced by a perverted secretion of the stomach itself, thus preventing the healthy effect of the bile in digestion, or by an acetous fermentation carried on in the stomach and bowels from the unfitness of the patients diet to his assimilative powers: the constitutional diseases, and distressing disorders and irregularities of the di-

gestive system are numerous, perplexing, and obstinate in the extreme. These affections in adults, and particularly infants, noticed in detail; the gouty taint a fruitful concomitant, if not cause of it; the kidneys involved in this form of gastric acidity, and the urine always changed from its healthy proportions of constituent principles; this is never or rarely the case in infantile gastric acidity. The reasons pointed out. These remedies indicated in chlorosis, in combination with medicines of emmenagogue power. In cardialgia, should be united with tonics. The effect of sedentary habits, and the depressing passions, as envy, hatred, malice, &c. in engendering the gastric acidity. The total inefficacy of antacid medicines, in chronic cases depending on moral causes. The effective power of remedies of antacid virtue, most conspicuous in recent, or acute cases. The efficacy of antacid diet considered; its comparative utility with antacid medicaments contrasted. The bearing of the Broussaisan doctrines of enteritis, gastro-enteritis, &c. on the antacid practice, whether by diet or medicines, enquired into. The danger of this system, shewn, in the treatment it leads to in gastric acid disease and disorders.

ANTISPASMODICS.

These are substances capable of arresting and subduing undue muscular actions, called spasm—in the excess of inordinancy, termed convulsion; and of assuaging pain, not by the mere production of bodily quietude, but yet unaccompanied by that high state of insensibility induced by substances of narcotic power. I am of opinion that all the remedies usually denominated antispasmodics, do more or less induce mental insensibility, or rather apathy. Their operation in allaying pain differs from that of narcotics, which, more certainly have this effect, —by involving the sensorium in a less degree. The effect of musk, galbanum, assafœtida, castor, ammonia. saffron, cajeput oil, valerian, &c. &c. in controling muscular spasm. has always appeared to be accompanied by some transient insensibility; nor can I well conceive of a substance of unequivocal antispasmodic virtue, commanding the actions of muscles but through the same channel from which they derive the moving spring of their healthy action. Exemplifications of the narcotic effect of all antispasmodic substances given. The remedies under consideration, are not singly that set characterized by the virtues of musk, assafœtida, &c. but comprise a vast assemblage of other medicaments, which have an equally powerful effect in controling the associative actions of the mind and body, but which are arranged by those who classify the articles of the Materia Medica, under other classes. These are narcotics, tonics, diaphoretics,

emetics, cathartics, diuretics, &c. &c. from all of which, articles endued with the power of antispasmodic operation may be drawn, according to the condition of the individual system spasmodically disordered. Excessive irritability from watchfulness, the angry passions, the sudden abstraction of a customary stimulus as in mania á potu, &c. may produce spasm, wounds, and irritation in infants. from indigestible food, dentition, worms. &c. also produce it ; and it occurs in epileptic habits, and in delicate females, attended, if not induced by a state of extreme debility or want of tone in the general system. In these different states of the system the remedy which is to cure the spasm, and must therefore be considered an antispasmodic, must vary,—it may be a simple tonic, or an astringent tonic, a cathartic. an anthlementic, a diaphoretic, an emetic, blood-letting, the cold bath, brandy, a narcotic, as opium or camphor, or moral discipline, and mental castigation and reform. The subject pursued in detail, shewing eventually the inutility of classifying the articles of the science, which so intermingle with each other, their respective properties.

An enquiry into the circumstances which contraindicate the absolute antispasmodic substances, in cases where spasmodic disease or derangement exists. The difference between tonic and clonic spasm. A glance at the "spasm of the extreme cuticular vessels." the foundation of Cullens' Theory of Fever, and his remedies and rationale of their operation. A designation of the diseases in which the narcotics, as antispasmodics, are preferable to any other.

ANTHELMINTICS.

Various parts of the human body form a domicilium for different parasitic animals, but they chiefly infest the stomach and bowels. The ancients were well acquainted with the worms infesting our bodies, and both, Hippocrates and Galen have written concerning them. In modern times, this subject has been more noticed and the habits of the intestinal and stomach worms and the disorders these parasitic pests produce have constituted fruitful sources of investigation; indeed, there seems nothing further to be developed as far as regards the characteristic traits of the different kinds, or as far as concerns their manners, though there still exists and probably ever will, a confusion of the symptoms of worms and those of other diseases. As regards the animalculæ, &c. few are settled in the opinion relative to the cause of existence, or necessity or use of these parasites, or whether they be entirely peculiar to and form a necessary part of our bodies. or are wholly extraneous to it. There is much reason to infer the truth of both these latter positions. Of those parasites which appear naturally to belong to us, may be instanced, millions of animalculæ, or organised molecules, observed in some of our fluids. Observations on the mesenteric blood, and *s.* masculinum. &c. The animalculæ alluded to, are always present, only die with us, and if they do not, and it is not ascertained that they do, aid in the performance of any function, they still may be said to be

congeners. The extraneous parasites are the larvæ of different lepidopterous insects, beetles, flies, butterflies, gad-flies and others, infecting intestines nares &c. &c. Inquiries into the manner of their introduction, whether by food or otherwise: cases detailed of those whose mode of life exposes them to these larvæ: hair worm of Laplanders, from marshy water. &c. &c. These larvæ not so common to human species but every where infecting horses, sheep and other cattle, and those chiefly who attend on them. To the head of extraneous parasites may be added the Guinea worm which insinuates itself into the flesh of the human body. A third kind of parasites infests our bodies, which in all its varieties has attracted much attention with physicians, because of the annoying and even fatal disease they produce—intestinal and stomach worms. For their destruction, various are the medicaments of reputed power: as these have been supposed endued with a specific noxious property, they have been denominated anthelmintics. An enquiry whether there be any such specific property inherent in any of the remedies usually employed, or whether they do not act by their common evacuant property, and in many instances by the invigorating effect of their bitter tonic quality. Different opinions are entertained respecting the pristine formation within our bodies, or extraneous origin from without, of these parasites. Perhaps both opinions are correct, the reasons why. As the different anthelmintic medicines possess very different powers, (according to the commonly received opinions of practitioners,) in disgorging or destroying the different kinds of worms, it is highly requisite that all the genera and species, with the concomitant morbid derangement they induce, should be well known by students, that they may

be the better prepared to hear of the articles supposed to be suited to the expulsion or destruction of each; and that they may know when to apply either of the numerous remedies reputed to possess anthelmintic virtues. These considerations are the more interesting to the student, and require the more of his attention, from the fact, that notwithstanding all the attention which has been paid to this subject, by enlightened men, it is a melancholly truth, that but little of certainty has resulted beyond the clear exposition of the natural history of these animals. We still know, comparatively with the laborious investigations on the subject, but little of the general pathology of worms: little of the symptoms they immediately excite. What is known the student should possess himself of thoroughly. Before detailing the heads of these points of discussion, it is necessary to know that the intestinal canal is infested by five different kinds of worms.

1. The Lumbricus teres, or round worm: Resembles the common earth worm, but presents many discrepancies of structure, is from 8 to 15 inches long, infesting chiefly the jejunum and ilcum, is sometimes erratic, proceeding to the stomach, throat and mouth, mostly in pairs, not unfrequently thirty or forty have been found together, and rarely solitary. Affect the system under 15, most generally under 8 years, and rarely adults.

2 and 3. The tænia, or tape-worm, so called from its resemblance to tape; is very long, from 20 to 30 feet, and cases much longer have been reported: infests the upper part of the intestines of children and adults, feeding on chyle. Sometimes solitary, generally imagined to be always so, not strictly true. Dr. Nitret mentions a woman who discharged 18. The detached joints of one kind resemble gourd

seed, and hence called *vermes cucurbitinus*. each joint incorrectly supposed to be endued with independant life. It is the first of two kinds and called the broad tape worm, (*tænia lata* and Bothriocephalus latus,) occasionally ending in two processes one larger than the other, most generally in one. Its head resembles that of the second species, called tænia solium, or long tape-worm. The immense length of the tape-worms, (Bœrhaave saw one 30 ells long, and Brera mentions one in the cabinet of the University of Pavia more than 230 feet long,) together with their tenaciousness of position, renders it extremely difficult to dislodge them entire. When their partial extrusion from the body takes place. the residual articulations speedily increase, and reproduce all the distressing symptoms, peculiar to their presence. Notwithstanding their usual tenacity of lodgement, they sometimes are spontaneously discharged, either partially or entire, by stools, from persons who had not previously experienced any premonitory signs of their existence. Instances mentioned of their having dropped from a person, by any exertion in walking. The gourd-seed tænia is readily known from the other by having a small aperture (osculas, little mouths) on the centre or middle of the flatened surface and only on one side, this species seldom parts with its joints, but the other does very frequently. The joint of the gourd-seed worm are easily separated from each other when the animal is alive, each joint thus separated has the power of retaining life a considerable time. Tape worm infects the smaller intestines chiefly, and it sometimes occupies so large a space of the jejunum as to give the sensation to the patient of a ball rolling about, when he turns in bed. They however sometimes get into the-

stomach ; the case of a Dutch peasant is recorded by Van Dœvern, who vomited 40 ells of tape worm. Emetics sometimes thus dislodge them by the mouth. These horrible animals are more common in some countries than others: in Switzerland, Russia and Germany are frequent, more than in Britain and the United States. They not only infest very young children but according to records, have been found in the alimentary canal of the fœtus in utero.

The 4th species of parasitic worm, is the ascaris vermicularis, or thread-worms:—these are about half an inch in length, of a yellowish white colour, and remarkable quick and agile in their movements. They domiciliate in the mucus and thin fæces of the colon and rectum, chiefly the latter—feeding most likely, on the mucus. They are occasionally erratic, having been found in the vagina, and about the thighs.

The 5th species of parasitic worm is the trichuris, or Tricocephalus dispar, long thread-worm. It is a spiral worm, from an inch to an inch and a quarter or two inches in length, marked exter-nally by numerous transverse annulated lines:—one part of the body terminates in a slender hair-like coil, the other end in a spiral convolution ending in a broad obtuse hook, which has been compared to the pistil of liliaceous flowers. From this extremity the animal puts forth a tube invested in a sheath ; it is formed generally in the cæcum or ileum.

The disorders which arise from these worms, are numerous ; and in infancy, not seldom fatal. The similarity of the symptoms they produce, to those of teething, is striking—not always easy to distinguish between the one and the other ; also to those of dyspepsia, from which they are in like manner,

with difficulty distinguished. Children troubled with any of the species, complain of a gnawing, uneasy sensation at the stomach, which eating appeases. The appetite is capricious—inordinate—sometimes voracious; belly hard, tumid —morbid vigilance, hiccup. disturbed sleep, grinding of the teeth, starting from sleep with terror and screaming, head-ache, vertigo, convulsions, feverishness, thirst, foul tongue, bad taste in the mouth, fœtid breath, nausea, constipated bowels and tenesmus, or looseness, with filmy threads and mucus, puffed upper lip. These are the chief symptoms induced in children; but there are often anomalous signs of the presence of these pests, as squinting, slow emaciation, sallow or livid countenance, protruded eyes, inflamed tarsi picking the nose from the sympathetic irritation of the lining membrane; hæmorrahages from the lungs, the brain, the uterus and the nostrils; a short, dry, sympathetic cough, or pains in the breast, without corresponding affection in respiration; unhealthy urine, and all the symptoms of chronic hydrochephalus. Indeed, it is often quite impossible to distinguish between the symptoms of this cerebral disease and those of worms, and there is little doubt, that one is often treated for the other; and that the constitutional disturbance produced by worms is so various and extended, that much obscurity must ever attend the treatment. Ascarides produce chiefly local disturbance: a heat and constant itching about the anus, which is teasing and intolerable in the extreme. Bowel affections are occasionally produced by them, such as slimy stools, tenesmus and cutting pains: vertiginous head-ache, itching of nostrils, convulsive cough and dyspeptic disease are more rare concomitants:——all exasperated towards evening. Brera, is of opinion that the

tænia may be known from the round worm (which produces colic and rending pain ;) by a pain in the belly with a turning motion and weight in the side, as if produced by some living thing ; occasional pricking or biting sensation in the stomach; the belly swelling at intervals and suddenly subsiding; voracious appetite, unattended by a corresponding well fed appearance, but by emaciation and feebleness of the limbs ; a feeling of constriction in the nose, vertigo, vomiting, and "an uneasy feeling on hearing music, particularly that of the organ."

From the preceding train of symptoms, it will readily be seen that the remedies supposed fit to counteract the constitutional disturbance of these parasites, must be various; most of them act so manifestly by their drastic cathartic property, or purging effect, as castor oil, that there seems little propriety in calling such, anthelmentics. Some are supposed to act mechanically, as tin, cowhage, cold water, which produces asphyxia in the animal, when applied to it alive out of the body ; the fixed and volatile oils: castor oil and turpentine, are also supposed thus to act—erroneous.

The tænia seldom resists turpentine. Bitters affect chiefly the round worm ; while alkaline and irritating enemata most readily dislodge ascarides.

As I have discarded the classification of medicaments altogether, in these lectures, it is scarcely necessary to observe any thing relative to the articles ranged improperly under the class now noticed, by writers and teachers who adopt classification. For my own part, I somewhat doubt a specific anthelmintic property as pertaining to a single worm-remedy. It would not be difficult to shew, that they rather act by other properties in their effect of destroying worms. There are few cathartics, and few bitters, and few astringent ton-

ics which will not more or less remove worms. The cold bath, external frictions, exercise, bitter articles of food, as tansy pudding, and olives, &c. all act against them. The physician will err who assails his infested patient only by direct vermifuges. The longer rout of constitutional invigoration, will most surely enable him to reach his end. Erroneous impressions are entertained with regard to the influence of certain kinds of diet in the production of worms:—sugar, for example, is supposed capable of generating them. On the other hand, there is as much reason to consider it an anthelmintic, as many other substances called so. A well directed, generous diet, is inimical to the formation, growth, or tenacious lodgment of worms; a spare and meagre regimen, whether from poverty or mistaken views of health, favours their existence, and renders their continuance certain, and their disturbance distressing and fatal.

AROMATICS.

Substances possessed of fragrance, and which quickly excite a sensation of pungency and warmth in the mouth, and when swallowed, also in the stomach, and thence diffusing a continued stimulating effect on the general system. They are more or less tonic. Some writers separate them from tonics in a class named as above. In Murray's arrangement they are disposed of under the class of stimulant tonics, without a sub-class providing for their aromatic property. This appears to me a defect in his classification, which has properly been noticed by Dr. Paris, as such. Simple tonics are characterized, not only by more bitterness, but have a more permanent effect. The operation of aromatic stimulants is more vehement and evanescent; their tonic effect, though continued for a time, is certainly not permanent. Their proximate principle is moreover different, consisting perhaps altogether in active essential oils, and not alkaline bases—and the chief effective benefit they render in substance, may be procured from the exhibition of these essential oils in small quantities alone, or variously made into emulsions or mixtures. I can conceive of no propriety, if classification is aimed at according to a similitude in effects, of arranging with such articles as chincona and calumba which I will assume as types of the class of tonics, any of the following substances: Winters' bark, cinnamon, cassia, canella alba, cloves, all of the natural family *piperides*, angelica root, laurus ben-

zoin. (spice-bush) sassafras. cascarilla bark, nutmeg and its arillus or investing substance, mace—cardamon. anise. fennel, coriander. dill and cummin seeds. all the species of menthæ and monardæ. many of which yield a camphor as narcotic as common camphor, lavender. rosemary. marjoram. pennyroyal. dittany. &c. &c. While on the other hand it must be acknowledged that ginger. calamus. Kæmpferia rotunda. serpentaria. contrayerva. asarum canadense, and other articles of secondary power, while they are endued with a manifest aroma, and stimulant tonic property, do nevertheless, yield little or no essential oil; and require to be administered either in substance, infusion or tincture. In so far they appear to hold a middle station between the aromatics first mentioned, and the simple tonics, and bitter, or bitter-astringent tonics: the former being profitably and properly resorted to through the medium of their essential oleaginous and volatile principle, while the latter can alone develop any remediate invigorating influence, by a mode of exhibition widely different. These observations tend to sustain the position I have taken in these lectures. of the nugatory efforts at classification. Surely if the preceding substances are all tonics, they are so by very diverse proximate principles, no less than by extremely discrepant modes of acting on the living system: and any attempt to unite them in one class is as unsatisfactory as subversive of the very principles of classification assumed. The only rational disposition of the articles called tonics, is, I think, into sub-classes of:

1. Simple tonics.
2. Bitter tonics.
3. Astringent tonics.
4. Aromatic tonics, yielding essential oil.

5. Warm tonics, or those possessing aroma, but yielding no essential oil; or, if any, not communicating the whole of the effects to the system, as when exhibited in its native state of existence in the substance itself.

The latter sub-division of aromatic tonics into two sub-sections, would accord with the pharmaceutical propriety of their exhibition as medicines. To conclude, I shall, in the tabular view to be given, of the articles of our subject, according to the characteristic and useful property they may severally contain, so modify Murray's arrangement, as to secure the above sub-division of his class of tonics. This I believe to be a better distribution than that taught by the late Professor Barton, which was a modification of Dr. Cullen's arrangement.

Most of these aromatics are the native growth of the tropics, none of high latitudes, though a few are found in the north-western part of North America, and countries of similar constituted climate. The essential oils of nearly all, have some properties in common with each other, which properly come under the chemical consideration of the subject. Medically viewed, they are, when given internally, warm, stimulating and grateful from their fragrance; and hence act as cordials and not seldom as antispasmodics. Some one of them enters into all carminative mixtures: and they all gratefully reconcile to our taste, the offensiveness of other drugs with which they are mixed in prescriptions. As they excite the brain and sanguiferous system, it is requisite to avoid them in any considerable quantity, in cases where either is unhealthfully roused.

In the treatment of all exhausting affections of the bowels, as cholera morbus, particularly when

these affect children, they constitute a sudden and effectual remedy against collapse. They assuage the rending pains of colic, and of the stomach, from any cause which may not have induced inflammation, both safely and with promptness. They check undue vomiting, whether spontaneous or from the over-action of an emetic medicine. Those of them which are used as condiments, form an essential part of the restorative diets and stimulating bevcrages of convalescents; and, in a state of debility enable the digestive powers to assimilate farinaceous and other food, which might, without them, create flatulence and pain, during the process of digestion. If moderately used, they are healthful to all persons of delicate habit, and if at any period some excess may, without injury, be committed in their dietetic use, it will be found that during the debilitating effects of excessive heat in summer, in warm climates, this excess is most easily borne. During the high range of the thermometer even in our own climate, I am of opinion, we resort too sparingly in our diets and beverages, to these grateful cordials. And this too, I think, from an unwarrantable prejudice against them, originating in a false idea of their properties and effects. I have done much good in the treatment of intermittents, by the liberal employment of dietetic condiments, as cayenne pepper, pimento, nutmeg and mace.

Externally applied, the aromatic essential oils are considerably acrid and inflaming. They stimulate the skin excessively, and the oil of cloves even acts as an escarotic. The oil of origanum (oil of horsemint,) is exceedingly powerful as a rubefacient, and has been beneficially applied to stimulate the rigidity of articular chronic rheumatism, and restoring the joints to their freedom. Ex-

ternally applied in substance to the belly, a combination of these articles under the name of pulvis aromaticus, is one of those preparations. the ingredients of which are at hand in almost every family. peculiarly suited to arrest the dangerous gushing evacuations by simultaneous vomiting and stool. which occur in the sudden and vehement attacks. attended with icy coldness of nose. ears and extremities of fingers and toes, of that fatal disease, cholera infantum. I have in numerous instances had occasion to believe the life of my little patients were snatched from the grasp of death. by the promptness and vigour of this application. In the dry belly-ache, which I have witnessed in sailors, this remedy has, in my hand. proved equally prompt and useful. Aromatics are much used as odontalgic remedies. Their effect on the nervous system is manifest. Indeed some instances of excessive action on the brain have been reported. The hypnotic power of nutmeg in the East Indies, is noticed by Bontius, as a frequent occurrence; and in the records of German medical literature, some extraordinary effects on the nervous system, have been noticed, as produced by this aromatic. Cullen speaks of having accidentally seen the soporific and stupifying power of the same substance. In cases of gout affecting the stomach, attended with that coldness of the extremities and unbalanced action of the sanguiferous system, appertaining to that affection, I have seen an infinite deal of benefit, from the liberal employment of aromatics of the most intense activity, as oil of cloves: and I know of nothing so well calculated to reinstate the stomach in in that healthy action so much perverted by the use of balsam copæva, as ginger in some form, or cinamon tea. In fact, a habitual resort to aro-

matics, singly or in combination with other medicines, in a long course of practice, predicated on the the daily experience I have witnessed of their beneficial effects, emboldens me to say, that too little attention is paid to their condimental effects, and too sparing a use made of their medicinal properties, by the majority of physicians. The full investigation of their practical application, is therefore strongly recommended to students.

D

ASTRINGENTS.

Astringent remedies are substances which constringe the living animal fibre, and consentaneously invigorate the system. In the arts they are variously used. They condensate the dead animal fibre in certain processes, as the tanning of leather.

There are numerous aspects in which the class of medicines possessing an astringent property, may be viewed, each presenting much difficulty and uncertainty. Among them their mode of operating is particularly perplexing. Cullen and Spielman commence their treatises of the Materia Medica with this class. Many attempts have been made to abolish it, the reasons alleged for such design: reasons why it might be abolished, even from those works in which the system of classification discarded in these lectures, is pursued. The substances could readily be disposed of under the classes of tonics, &c. Cullen's opinion in relation to the mode of operating of this class of medicines, discussed. He believed they acted chemically upon living, as they do upon dead matter in the process of tanning. Difference of the action of astringents on dead and living matter, evidenced in the certain addition of weight they make to the former, and the very inconsiderable quantity absorbed, by the living system, when an astringent liquor is applied externally to any part of it. Notice of Davys' experiments relating to the augmented weight of hides by the absorp-

tion of tannin and extractive, exlsting in the oak bark. Experiments of Rousseau, Klapp, Dangerfield and Muzzy noticed. Seems unquestionable that astringent fluids are, like other fluids applied externally, taken into the system in part, by cuticular ingress, but not in sufficient quantity to affect the gelatinous fluids they would meet with in the living as well as in the dead body: would be resisted by cuticular blood vessels, &c. The living principle seems to resist the effect of tanning; exemplified in the condition of animals existing even in a torpid state, exposed to the action of astringent matters. The effect of astringent peat-moss upon human bodies; of astringent infusions, &c. on butchers meat. Effect of bark in arresting gangrene; does so by operating on the adjacent living fibre. Not fair to infer it does this by astringent property, since camphor, assafœtida and other substances, destitute of astringency, produce the same effect. Even the most powerful astringents will not arrest gangrene. Mr. James Moores' experiments noticed. He renders it probable that oak bark does not cause contraction of the living fibres. Effect of alum in corrugating the papillæ of the tongue noticed, Darwin's rationale of that effect. In a word, the action of astringents on living, and dead matter, is different, as in the case of other medicines, for example lunar caustic.

Effect of astringent solutions applied to lactiferous plants. Opinion entertained by some that astringent bodies operate chiefly on the part to which they are applied and are rarely communicated to remote parts of the system through the medium of nervous or muscular influence—erroneous: the daily operation of astringents in the treatment of diseases, opposed to such an idea. Dr. Heber-

dens' notions concerning the use of astringents in hæmorrhages, tainted with this idea; the theory at variance with effects of sugar of lead, &c. in arresting pulmonary and uterine hæmorrhages, and hence leads to injudicious practice. Madder unites an astringent with a colouring matter, the latter has been proved to be carried into the circulation; it is no violent supposition, that the astringency of this or any other article, may in like manner, be taken up by the lacteals, though in small quantities. The beneficial effects of astringents on the body, cannot be explained by the idea of their astringency being taken through the course of the circulation, because one or two grains of quinine will avert the approach of an expected paroxysms of intermittent within a short time after its exhibition, and two or three grains of sugar of lead, will command an excessive uterine hæmorrhage, in half an hour after it has been given. The time and quantity in both instances too inconsiderable to suppose their agency to seek the track of the circulation. They operate differently. They act probably by impressions made on the stomach and intestines primarily, and thence are conveyed by some of the operative influences of the living system, quickly to the solids and fluids. Hunter and Darwin's *recently purloined* doctrines of sympathy a very convenient rationale, though *near half a century old.*

Woodhouse's, Seguin's, and Dr. John M. Walker's (VIR.) experiments relative to the astringent principle, noticed:—

For the opinion of the first, see his edition of Chaptall's Chemistry. Cultivation deprives many plants of a part of their astringent principle. According to Hatchet, a factitious astringency may be produced by treating various vegetables with nitric

acid. Method of detecting this principle in plants: by application to mouth, and by effects on living animal body, by solution of copperas, &c. Cullen's opinion relative to the degree of corrugation induced in the mouth, as a criterion of the intensity of the astringent power in the substance used.

The astringent principle resides in cortex and liber of most oaks and peruvian barks: in the liber of many trees and shrubs, the cortex of which possessee little or none of it; in the roots of numerous plants, as the ratanhy root, alum root, tormentil, rose tree, geranium maculatum, &c. In the wood of many trees, as logwood; in the leaves of many plants, as shumach, common green tea, &c.: in the excressences which form the nidus of insects, as oak-apple, aleppo-galls, &c. in the latter it exists united with a peculiar acid which has received the name of gallic acid. This was once supposed to be the astringent principle; not correct; galls do not contain more of this acid principle than other astringent vegetables: Higgins' experiments shew that some species of shumach contain more than other vegetables, yet analised. Chemical properties of gallic acid.

MEDICAL USE OF ASTRINGENTS.

Of the use of astringents in diseases:—best given in substance, when the stomach will bear that form —otherwise, should be given in the pharmaceutical liquid preparations. Astringency is fixed in substances containing it; of course the absence of volatility in this property, renders it nugatory to employ the distilled waters of astringent medicines.

Watery and spirituous menstrua take up the astringency of substances, subjected to their action;

Cullen imagined a partial decomposition in cases of decoction, and hence prefered infusion. Dr. Morveau suggested ether as a solvent for astringency, as best adapted to convey that principle most readily into the system. Astringents long used in intermittents. The most effective remedies for these affections, are characterized by more or less astringency. The best are those containing astringency and bitterness combined. Astringents used in weakness from whatever cause—often injuriously. In certian dropsies, generally with benefit, where there is no great degree of febrile action. The late Professor Barton advocated their use, even where fever was present; a practice, according to my own experience of doubtful propriety, never having seen good effects from it.

The efficacy of astringents is chiefly evidenced in the cure of the profluviæ. They are used to check serous evacuations from the bowels, fluor albus, gonorrhœa and gleet, and the excessive discharges of other organs. It is supposed by many that they do this, rather by their tonic property than their immediate astringent virtue. Their power in checking hæmorrhages from the lungs nose, stomach, bowels and uterus, while it is undeniable, presents one of the most difficult subjects for medical ratiocination, which occurs in the whole science of Materia Medica, and the modus operandi of its subjects. Their exhibition not safe, without close attention to the state of the circulation; indeed with regard to hæmorrhages, astringents are *absolute* and *relative*. A very different substance as an astringent is required to check that bleeding, called *active* accompanied with a tonic contractile power of the arteries, and that called *passive* which happens during an atonic or relaxed condition of the same vessels.

Cases in which blood-letting must precede the use of astringents. Applied externally in hæmorrhages, astringents are called styptics. These are numerous, of ancient date, and some of them powerful and effective.

Astringents were formerly much used in dysentery, in which disease their efficacy has been strenuously opposed by Cullen and others. They are inadmissible in this disease as it occurs in a variable and intemperate climate: under a tropical sun, they are useful, and proper in the secondary stage, and under an intermitting type of fever, particularly the astringent tonics.

These remedies have been much used at antilithics and certainly some of the class, though not those which are most conspicuously intense in their astringency, are serviceable in calculous affections, as the uva ursi.

The most ancient employment of astringents, was most probably as a cure for intermtttent fevers: those of the purest kind, do not appear so well calculated for this purpose, as those connected with bitterness. Cullens' opinion respecting the efficacy of the salts of iron, as astringents, in that debilitated condition of the system, preceding dropsy, considered. This practice at variance with the later received pathology of that disease as taught by Rush and supported more recently by Ayre. The practice of exhibiting mineral astringents in solution, by injection, to check inordinate evacuations of the urethra, nearly obsolete, reasons why dangerous. Vegetable astringents given in pyrosis, colliquative sweats of consumption, and the wasting sweats of autumnal fevers, with benefit. Metallic astringent collyria, as of lead zinc and copper, used in certain kinds of opthalmia with benefit; often injudiciously resorted

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to. at too early a period of the disease. The efficacy of a certain vegetable astrungent pith, in the same affections. Solutions of acetate of lead, used in phlegmonous inflamation : in erysipelas, its effects. Vegetable and mineral astringents useful in scurvy. Different modes of application in which I have found them serviceable in that disease, at sea, and on land. Have also been advantageously used in the neuroses, as tetanus, chorea, epilepsy, asthma, pertussis : for these diseases cinchona misletoe, bistort, the salts of iron, copper, zinc and tin, have been prefered : not so useful as the narcotic stimulants in these affections. In plethoric epilepsy, certainly hurtful: in hysteria the mineral astringents useful, acting as antispasmodics in subduing clonic spasm. Of doubtful efficacy in asthma, unless in lax female habits, where it occurs as a symptom of hysteria. In that case, as in anginose affections from other causes, as gout, &c. they are serviceable, and my experience warrants the assertion. Their efficacy in hooping-cough, cannot be supported, unless invigorating exercise in cold air, be considered as acting by its astringing influence.

In cutaneous diseases, astringents have long been favourite remedies, internally and externally exhibited:—as the itch, scald-head, psoriasis, and other leprous affections. They succeed where every thing else has failed. In these and in other affections, they enhance the power of mercurial medicines. Kino ointment, in psoriasis : mercurial ointment with powdered kino. Astringents have been used in rickets ; if any are serviceable, the metallic astringents should be used ; in scrofula, astringent bitters used ; atonic state of lymphatic system, often relieved by them. Powdered vegetable astringents always are the bases of

quack remedies for cancers and cancerous ulcers—how used. In hæmorrhoids. galls in form of ointment useful; other astringents answer the same purpose; in indolent ulcers, and the ulcers from burns, astringent vegetable infusions, as washes. important; astringent gargles, their use, efficacy and danger: of alum in diebetes; Dr. Gregory's notice of its effect in that disease. Selle, Meade and Dover, recommended this astringent as a cure for it. Summary of the comparative efficacy of mineral, metallic, and vegetable astringents, for the diseases glanced at in the foregoing notes. General remarks on the whole class, with notice of other and secondary effects.

Astringents have been said by Darwin, under his class sorbentia. to create costiveness; not always correct. Galls purge; alum purges; and bark purges. Effects of astringent infusions in striking a black colour with iron; catechu an exception, not containing any thing but pure tannin uncombined with gallic acid. Native astringents in the United States, numerous; and some peculiar in their operation, and important articles of the Materia Medica.

CATHARTICS.

Substances which promote or increase the natural perisialtic action of the intestines; or, exhibited in their established dose, induce that excess of alvine evacuation called purging. They have been divided into *laxatives*, which are characterised by a very mild evacuation of the contents of the bowels; and *purgatives*, which in addition to this evacuating effect, stimulate the exhalents of the intestines and cause a considerable influx of fluids from them, which are continued for some time to be passed per anum. They likewise communicate a stimulant and rousing impulse to the whole system. Those which cause all these effects in the highest degree of intensity, are again sub-classed, as *drastic purgatives*.

The laxatives may be said to be local stimulants —the purgatives general stimulants; and the drastic purgatives, general and vehement stimulants. The laxatives in reference to their power and effect in promoting the general health, are transient stimulants; the simple purgatives, impulsive and more continued stimulants; the drastic purgatives, persistent stimulants. They are all suited to peculiar states of the healthy and disordered constitution. The importance of these remedies requires no comment. Promoting and insuring that intestinal regularity and functional performance of an important set of organs, without which health cannot exist, they at once are the great key to unlock all the irregularities of the body, and

by a timely expurgation of their prejudicial presence in the physiological system. to restore its jeopardized healthy action, and avert. or even remove disease. Purgatives not only increase serous and mucous discharges from the exhalent vessels of the inner coat of the intestines, and the excretory ducts of their mucous glands, but they vehemently stimulate the adjacent viscera to a healthy action, as the liver and pancreas. Of the different remedies calculated to produce each of these several effects, more than others of the same class. Of the peculiar effect of saline purgatives, formerly called hydrogogues; of the mineral, of the mechanical, of the dietetic laxatives. Of those stimulating particular sections of the whole intestinal tube, as aloes, colocynth, gamboge, scammony, croton oil, colchicum, hellebore, &c. of the peculiarity of operation in jalap, in the mercurial purgatives, in the narcotic purgatives, in the purgative effect of antimonials; of emmenagogue purgatives, their peculiarity. Dr. Hamilton's opinion canvassed, "That the different species of purgative medicines do not possess distinct powers over the different species of matter to be evacuated." Of Paris' opinion that the ancient division of this class into hydragogues, cholagogues, &c. ought to be revived. Of the inutility and inconvenience of repeating for any length of time, what have been called the astringent or tonic purgatives: as rhubarb. Of the advantages in a medical point of view, of changing from one article of this class to another, in cases where permanent or long continued purging may be deemed requisite. Of the mistaken drastic effect of some purgatives: as aloes Of their contra-indication in pregnancy, and the opinions on this point, of distinguished practitioners of midwifery.

Effect of purges during the menstrual flux; caution necessary to be observed at this time. Effect of drastic purges in cases of great debility of the bowels; will induce marasmus, if too often repeated. and render the bowels morbidly irritable and liable to be operated on by a cause inadequate to move them in good health. Cathartic medicines may be variously combined to attain a union of the peculiar efficacy of each ingredient of the combination; advantages to be obtained by a knowledge of this part of the subject.

Purges produce sleep ever in maniacs. They raise the pulse under certain circumstances. Huxham says he found them to do so in the Devonshire colic: Sir Wm. Fordyce made the same observation in most putrid fevers; Dr. Rush likewise observed this:—Notice of his locked-up excitement. Produce hilarity of mind by removing collections of feces from the intestines; constipation always creates despondency and gloom. An enquiry whether cathartics are taken into the course of the circulation? Many articles of diet purge; and as their nutrient property is undoubtedly taken up, there seems reason to infer that the cathartic property may. Rhubarb most evidently taken into the circulation; its colouring matter pervades the urine; there is no proof that this colouring matter is distinct from its purgative, the whole root containing it abundantly. A reason in favour of the absorption, derived from the effect of purgatives taken by nursing women, on the bowels of infants at the breast. They also effect the urine, both by augmenting its flow and altering its composition. The general diuretic effect of purges, noticed.

Purges applied to open and running issues, often operate cathartically on the person thus subjected

to their application. Effect of aloes and castor oil applied to the belly of children and adults, noticed. Hellebore said always to purge, if applied to an issue. Query. Is the quantity of a cathartic thus absorbed, granting that it is absorbed, sufficient to purge? C. P. Berger gives an instance of a man purged by smelling a medicine. I have known an officer puked by mentioning ipecacuanha. to which he had an aversion; both accounted for by association. Persons under the operation of cathartics are readily injured by cold and exercise; reasons why. Dr. Gregory lays much stress on this fact. Perhaps in the treatment of certain fevers, where cool air is an important remedy in itself, an equal degree of injury cannot be apprehended from exposure to its influence during the operation of cathartics. Effect of cold affusions, in evacuating the bowels, as in colica pictonum, and other affections with torpid action of the intestines

The nitro-muriatic bath to the legs, purges. Walking barefoot on a cold pavement or marble, and enemata of cold water, have removed constipation. Some persons from idiosyncracy particularly liable to be purged by getting wet feet. Different constitutional susceptibilities of intestinal action, require very diverse doses of cathartics. Many females are readily purged by one or two grains of assafœtida, and powerfully by a small quantity of molasses, or rye mush, or an egg, or shell-fish, as lobster and crabs; others again are scarcely assailable in this effect, by the most drastic medicines. Seamen and persons at sea require larger doses of the same medicines than other persons. Pregnancy renders the operation of cathartic medicines more difficult. Climate influences the susceptibility of the bowels to be acted

on by cathartics. Doses requisite in the tropics and in high northern latitudes. Large doses used by army and navy surgeons of the East Indies. Different methods of employing cathartics, as in the suppository, substance, tincture, infusion, injections. Injecting fumes of certain narcotics as cathartics; attended with danger.

Diseases in which these different forms are resorted to. Effect of epispastics, as aids to purging in obstinate constipation; either over the belly, or remote from it; even on the extremities. Of ileus. Effect of gestation of certain kinds in resisting the operation of cathartics. Sea-voyages. Equitation to those unaccustomed to it, first induces costiveness; when habitual keeps the belly open. Effects of equitation observed in the dragoon recruits under my care, in the beginning of the war. Hyper-catharsis, in what kind of temperaments most likely to occur. Previous blood-letting enhances the activity of purgatives, and these latter promote the action of diuretics. How and under what circumstances they do this.

Purgatives diminish the action of the sanguiferous system, remove torpor in its operations, and restore its balance of power; they determine the circulation from the head to the extremities. The two-fold manner in which this is effected, noticed. They promote the absorption of fluids, from internal cavaties. In like manner produced by a two-fold operation. How they excite absorption in cases of dropsical effusion. They increase the portal circulation.

OF THE DISEASES IN WHICH PURGING IS NECESSARY OR USEFUL.

This is a fruitful topic; the practice of purging for disease as ancient as the earliest efforts toward medical aid. Even animals are guided by instinct to the purgative grasses and plants. Instances given. Purgatives essential in all inflammatory diseases, in their incipient stage at least. They are truly antiphilogistic remedies.

In the diseases called *neuroses*; particularly chorea, and hysteria, and in some cases of epilepsy. In chlorosis, and those disorders generally which occur during, or accompany puberty of both sexes. Eminently useful and curative in typhus fever; in scartatina. In both of which the axiomatic observation of Dr. Hamilton is of golden weight: "I beg to caution against the common association of purging, with the use of purgative medicines." Of their effect in obviating or removing the dropsical effusions which occur in the last stage of scarlatina. Of purgatives in marasmus, occasioned by worms, effectual: when from impoverished diet, of doubtful use. In hæmatemesis, when supposed reasonably, to be a vicarious hæmorrhage. In all cases of hysteria, requisite. In dysentery, important, being continued. In exanthematous diseases, highly essential.

In puerperal fever and common peritoneal inflamation, the bowels are torpid; require brisk purgatives, especially in the commencement. The Broussaisan doctrines oppose this practice. Of the particular kind of purgatives, useful in acute rheumatism; and the necessity of adhering to a certain kind in gout. Hydrocephalus internus, in addition to early and copious blood-letting, requires early and vehement purgatives; of less ac-

count in the advanced stage of the disease. Reasons for attacking the bowels in this direful malady, deduced from the symptoms, supposed causes, and post-mortem examinations. In apoplexy, useful. In palsy, when useful. In gutta serena, their effect. Of the use of purgatives in surgical practice. In hyprocondriasis, indispensable. This disorder in females, accompanied by hysteria, already noticed as requiring cathartics, as rhubarb and assafœtida united. In the treatment of all dropsies, cathartics in union with other medicines of different virtues, as diuretic, tonic and astringent, &c. indispensible. In a word, without purgatives there are few serious diseases, involving the visceral functions, and in any degree impairing or suppressing them, which can be judiciously treated. The necessity instilled, of the student becoming thoroughly acquainted with the peculiarities of operation, in all the different subjects of this class. General rules necessary to be observed in the administration of cathartics of whatever description.

DEMULCENTS.

Substances capable of protecting the sensible surfaces of the body from the action of acrid extraneous matter presented to them from without, or engendered by disease within the system. This they do mechanically, for the most part, by inviscating the acridity of the irritating cause, by reason of their mucilaginous or oleaginous nature. The whole of the subjects of this class, are referable to two sections; mucilages and expressed or bland oils. I have noticed the class in pure courtesy to preceding writers and teachers. It is perhaps the most objectionable group of the whole system of medicamental classification, not to say absurd. It is quite impossible for me to conceive any semblance of reason for grouping under a distinct class, a number of substances, which present in the very outset, an opposing barrier to their just retention under such a class—for, beyond the palpable mechanical effect of the bland substances, as acacia gum, in allaying the irritation of the partially inflamed glottis and trachea, in cough, and the exasperated inflammation of cynanche trachealis, I know of no substance which, consistently with any correct notions of physiology, can be recognised as demulcents. What demulcent property, or in other words, what inviscating influence can flaxseed tea, taken for gonorrhœa, exert, on the inflamed and discharging surface of the urethra? Will it be said the bland mucilage and oil of this article, which is more a nutritive beve-

rage, than a medicament, can be presented to the diseased urethra after traversing the circuitous track of the circulatory, absorbent, digestive or secreting vessels, or perhaps the whole of them, in its pristine state of viscidity? Surely such an idea is not tenable. True it is, as Dr. Murray has observed, the secreting vessels do some times render substances which have been thus digested, absorbed, and acted on by the secretory viscus, in this state of pristine character; and it cannot be doubted from the evidences given in the urine of this fact, that the kidnies especially do this: but the subjects they select for this preservation of individuality of property, are widely different in nature from the bland oils and gums. It is when very active substances, characterized by the intensity and persistance of their distinguishing property is presented to their secretory office. And for the most part it is the colouring matter, or odoriferous, or saline quality, that mainly appears unchanged in the secretion of the urine. The same observation is applicable to the excrementitious evacuations, after certain active or strongly marked aliments or medicines have been taken into the stomach; and also to the transpiratory office of the skin. I am aware indeed, that when gum-arabic has been given in considerable quantity to infants and children, as is frequently done, the gummy nature of the article is detected in the discharges per anum; a circumstance which has led Dr. Paris to a very incorrect pronunciation of the insusceptibility of pure gum (ununited he says with the bitter principle!) to yield to the assimilative functions: and he *misquotes* in corroboration of this remark the assertion of a late author,* that "it frequently passes through the bowels, very little changed, as I have

* Dr. Chapman.

witnessed a "*thousand* times." In justice to the author thus materially misquoted, on a point too, I think, of practical importance, I here correct Dr. Paris, by refering him to the different editions of the "Therapeutics" for the substitution of "*an hundred times*," instead of a "*thousand*" which lessens the strength of his corroboration on the authority quoted, ten per cent: or, in other words his position on the authority assumed, is ten fold less important than he imagined. And even his authority admits the nutritive (and consequently easily assimilated quality) of the article in question, by quoting Hasselquists report in its favour. I am the more desirous to remove this error supported by such alarming round numbers by Dr. Paris, from my total discredit of the correctness of any opinion, from whatever source emanating, which impugns the nutrient nature of this invaluable substance, in the treatment of certain bowel complaints of children emaciated by a long continuance of an enervating complaint. The truth is, gum-arabic is never thus passed *wholly unassimilated*, even in diseased constitutions—much, less in those of a healthy condition; but it is natural to suppose, that in the impaired if not depraved condition of the digestive functions, in those cases in which it has generally been directed as aliment, that some portion of it, over what might be equal to the demands of the system thus suffering under weakened digestive powers, should be excrementitiously passed. I have seen this often myself, from the use of what I supposed to be gum-arabic, but which was probably sophisticated: but, nevertheless, a due and sufficient quantity has, in such cases, been taken up and appropriated to supporting the sinking powers of life. That this has been the case in numerous instances under my own care,

some very strikingly verifying this supporting power, was proved, because for weeks at a time, the little patients received *no other aliment whatever:* and yet the disease mended, and the constitutional powers were reinstated, during the free use of the gum, and during the very time I observed the diapers to be stiff when dry, from the gummy nature of the stools. But, even in these cases I have been disposed to believe that the article was not pure, but adulterated during its pulverization, by a resembling gum, very difficult of digestion, and far less, if at all capable, of supporting the powers of life by its nutritive quality—gum-senegal. A strong predilection in early life, unaffected by subsequent experience, in favour of the soothing and healing nature, and nutritive quality of gum acacia, has led me to many experiments and much satisfaction with it: nor am I disposed at this time to admit that the genuine gum is surpassed in susceptibility of digestion, where the bowels are affected, and much emaciation exists, by any article in the whole Materia Medica. Lind tells us, that with the negroes along the banks of the Niger, it is almost their only food; and that the Moors live entirely on it when their crops of rice and millet fail. These are examples of numerous reports in favour of the nutritive property of the gum in question, which will be detailed when treating of the article. Fordyce has said that the nutrient principle of vegetables resides in their mucilage and gum. The nutritive property of sugar and oil is admitted; and the salubrious effect of acid in diet, also acknowledged. Where then are we to look for a nutrient, if gum-arabic, which is not a simple substance, but contains a gum, an oil, a mucilage, a sugar and an acid, does not yield such?—With respect to the demul-

cent property of gum-arabic, I am not prepared to speak so confidently, but subscribe to the pithy remarks of Cullen on this head. He disclaims a belief in the power of its "correcting the acrimony that occasions coughing," and its supposed power of "reaching the urinary passages, and there to cover any acrimony prevailing in the urine," and that "gum-arabic as an internal demulcent, can be of no service beyond the alimentary canal"–and that from "innumerable trials, he never observed the effects of gum-arabic in the mass of blood, or *in the excretions derived from it.*" And he further remarks, that in ardor urinæ he has been often disappointed in its effects and had "found that two pounds of water or watery liquors, added to the drink, would be of more service than four ounces of gum-arabic taken without such addition." The demulcents then are fairly resolved, I think, into this nothingness; and their reputed efficacy in diarrhœa. dysentery, calculus and gonorrhœa, stands a baseless fabric of misconception and error, In short, the class itself, is. as I have advanced in the outset of these observations, if not an absurd at least a very unnecessary one; and the subjects it comprises. as, (besides those already discussed,) liquorice, isinglass, spermaceti and wax, may be disposed of under the head of expectorants. The other gums and mucilages, and the amylaceous feculæ, as starch, tapioca. sago, salep, arrow-root, wheat-flour, together with olive oil, under the section of restorative dietetics. Flaxseed, slippery elm bark, altheæ flowers, mallows, almonds, &c. &c. under the class of Diluents. Without better grounds. than it appears to me exist at present, the class should be expunged. and in my tabular distribution of medicaments, I shall so modify Murrays arrangement,

as to meet this disposition. In the mean while these hints will enable you to understand and appreciate the views and practice of medical writers, who think and practice in obedience to the belief in demulcent remedies.

DIAPHORETICS.

Medicines which augment the natural transpiration of the skin. They are divided into two sections, according to the moderate or high grade of their action, called *diaphoretics* and *sudorifics*. Those which excite the skin so slowly, that its perspirable fluid may be evaporated by its contact with the air, and thus rendered insensible to observation, except by the soft state of the surface, or by very close inspection, are refered to the first section. Those which produce that copious fluid discharge, which we call sweat, are disposed of under the second. The only difference which appears to exist between these substances, is in their mode of acting on the exhalents of the skin. The same emunctories are liberated by both; but in the case of sweating, visibly and excessively. There are many methods of exciting the skin, which may all be comprised under three heads, physical, mechanical and medical. 1st. By external and mechanical means. 2d. By internal agents which increase the velocity of the general circulation, and thereby excite the action of all the parts of the body. 3d. By internal medicines which do not do this but enter the circulation, and thus reach the cuticular vessels: or merely stimulate some one, two, or more of the viscera, with which the skin sympathises, as for example, by a draught of cold water taken suddenly into the stomach, when the system is at par in its healthy excitement. For if it is otherwise the skin is not

reached by its impulse, but general injury, or local disorder will ensue. As for example. when cold water is drank largely, by a person overheated, in which case the powers of life are subdued. and death or infinite injury will result.

Among the first means of exciting the skin may be ranked exercise in all its various kinds; unusual bodily labour, the flesh-brush, or other frictions; flagellation, stimulating lotions applied, cold affusion, the warm and cold bath, new flannel. increased quantity of clothing. external heat. All these will be affected in the promptness and extent of their action, by the state of the atmosphere, in reference to its aridity or humidity.

Among the second means may be ranked, the carbonate of ammonia, guiacum, and the like; alcohol, and all the different wines and malt liquors, together with other fermented beverages containing spirit, as cider, &c.

Among the third means may be placed, all the saline diaphoretics and mercurial preparations, sulphur, some of the balsams, nauseating doses of the emetic medicines, especially ipecacuanha and the antimonial salts preparations and pharmaceutical compounds, &c. It is questionable whether the subjects of these last two sections are much influenced by atmospheric influence. Certainly they do not obey its power, in any thing like the same degree as do the means ranged under the first section. They, however, require the observance of certain cautions and rules, when administered with a medical view. The main features of these, are derived from a knowledge of the fact, that a very elevated state of the skin. (when it is 102 or 108 degrees of Far.) an energetic sanguiferous excitement, indicated by a full. hard. and bounding pulse, a purging state of the bowels,

(in febrile systems) and the patient being dressed and out of bed, are adverse to any artificial excitement of the skin, by the means grouped under the second and third heads of the preceding sectional arrangement of diaphoretics. It is therefore obvious, that whatever shall, under the existing circumstances, tend to obviate these opposing or discouraging influences, will be proper to be done, in order to ensure the cutaneous transpiration to the extent desired. It is frequently impossible to open the skin, until the arterial excitement be reduced by venesection, or previous and equivalent purging. And if these do not reduce the high temperature of the skin, it would be idle to attempt sweating, by internal medicines or external heat, the latter tending only to increase a temperature of the superficies already too exalted. Cold affusions only, will here effect it. My experience with the ardent fever of a warm climate, attended with an excessively dry and hot skin, enables me to speak confidently on this point.

OF THE MEDICAL USE OF DIAPHORETICS.

Health we know, consists in the due performance of all the functions of the body. I assume therefore, as an undeniable truth, that whichsoever of these is disturbed, is productive of disease or disorder, which will be proportionable to the degree of interruption which has occurred. It need hardly be observed, that as the whole exterior surface is designed to perform a transpiratory function, the skin, from its very extent and exposure to those vicissitudes and natural causes which can aid, support, lessen, check, and altogether extin-

guish the peculiar secretion thus thrown off in a state of health, must be peculiarly liable to meet with injurious impediments to its executive office. Suppressed perspiration is therefore a fruitful cause of disease, and what we familiarly call, taking cold, is often the effect of this restraint on the cutaneous function. When it occurs, the balance of circulatory and secerning regularity is deranged or destroyed, and the disorder or disease supervening, is not entirely removed, until the unbalanced actions of the body, are reinstated in their due efficiency. Nearly all the acute diseases, are attended with a disordered state of the skin, for the reasons already given. Hence the use of those remedies and means which experience has taught us are calculated to achieve so important a restoration of healthy action, has been coeval with the earliest practice of medicine. The common-sense view of the subject, has met the reasoning and observing faculties of mankind generally: and in consequence, sweating medicines have ever been among the most popular and general remedies in domestic practice. They have certainly from this cause, been injudiciously applied, and doubtless, often dangerously. The records of medicine which shew the transitions of practice, according to the prevailing theories and dogmas of the day, prove, that this abuse of diaphoretics has not been confined to the unlearned and the vulgar. Unfortunately the members of the profession of medicine in the days of Van Helmot, took a conspicuous stand in this ill-judged misuse of a set of remedies which we justly esteem, under proper regulation, invaluable. The diseases to which they are applicable are various: and are both acute and chronic. Their efficacy is conspicuous in dysentery, and some other bowel affections; in acute rheumatism after the inflammatory stage has been

smartly assailed by bleeding and other depletion. In gout they are of dubious efficacy, except under circumstances of great constriction of the skin, when I have known them, if of the lenient kind, productive of decided benefit. In the phlegmasiæ, they are dangerous often, and always hurtful, if early resorted to, and before a previous system of requisite depletion: aggravating the sufferings of the patient and causing tedious convalescence, if they do not induce worse consequences. Judiciously interposed in reference to time and previous treatment, they are beneficial. In remittent and continued fevers, *diaphoretics* always, and rarely *sudorifics*, afford important curative aid. Many have reported favourably of their efficacy in yellow fever. My experience with that disease in a climate to which it is endemical, as well as in some cases in our own, does not enable me to sustain these records. Neither can I, from the views of the pathology of the disease which I entertain, think, that they can be fairly estimated as very important remedies in this disease. I am aware, however, that critical sweats have happily terminated its course; and I am also disposed to believe that cases do occur, in which, contrary to the usual issue, they may be particularly required. But, the stomach, the chief seat of this disease, is too vehemently attacked, to be generally accessible by the circuitous rout, or sympathetic accordance even, of the remote cuticular surface. Not so in typhus fever; I would say ship or jail fever. Much experience with this disease, in the navy and army service, early convinced me of the necessity of vigilantly looking to the skin, and regarding its irregular and perverted actions, with great attention. Here there is no cure, until its softness and function is restored. I cannot,

however, consider ship fever, as precisely identical with the typhus of Armstrong. I have in the alms-house of this city, and in private practice met with and treated, the fever that author so admirably describes; but on ship-board, and at the lazeretto, and in fever wards established under my care for the reception of army recruits during our war, I have alone met with the typhus gravior of Cullen, or ship, jail, or camp fever. In these situations I have repeatedly used and profited by diaphoretics. In the disease of Armstrong I have depended more on early blood-letting and long continued purgative medicines in small doses. The skin returned to its duty after, or during the use of these means.

Plague has been universally treated by diaphoretic remedies; yet Chenot deprecates, and De Mertens, who wrote of the plague of Moscow, of 1771, omits to mention these as remedies. We fortunately know nothing of the disease. In diabetes, a disease I have never treated, and only twice seen, cases have been reported of their curative effect; but these appear to be insulated. Many authors speak favourably of them in dropsy; to me there appears so much more obvious a path to pursue, in attempts to cure this disease, that I shall dismiss this part of the subject by the remark, that, though diaphoretics may occasionally be useful, here, it will be more by accidental propriety, than a general necessity attendant on the disease. For my own part, I have never attached importance to their use in this disease, general or local. In syphilitic rheumatism and syphiloid disease, in mercurial disease, and in siphylis, diaphoretics form a part of the general practice of our time. The details of this subject will be entered on fully in these lectures, under the head of the particular

diaphoretics used. In perverse and unrelenting affections of the skin, diaphoretics are indispensible. In cholera infantum I cannot but remark, there is too much latitude assumed, in the recommendation of even mechanical diaphoretics, without designating the two very opposite conditions of the skin attendant on this affection. I have had my share of experience with this frightful malady. I dread it, yet seek it, wherever I can have an opportunity of observing its career, from my fixed opinion, that it is little understood, comparatively with the attention it has elicited and most seriously claims: and still less happily treated. I have, it is true, seen numerous cases in which a restoration of the healthy functions of the skin, was simultaneous with a happy change in the patients danger. But I have also seen innumerable cases in which the skin was morbidly open; rapidly transuding a cold and clammy secretion, while in every other symptom, an exact accordance was observed, with those cases, in which constriction, heat, and dryness of the surface prevailed: and conditions of the skin, intermediate between these extremes have not unfrequently presented themselves in cases the most alarming and fatal. I would not be understood to deter you from adventitious means of protecting the skin in this disease, from pertinacious morbid action, but simply to guard you against trusting implicitly, or even with confidence. to diaphoretics of whatever kind. The intelligence and experience of the medical attendant. can alone, afford the proper information on this point. Indeed this remark is equally applicable to the numerous contradictory testimonies with reference to the use of diaphoretics in some of the affections already spe-

cified: and in many others which will be hinted at in the course of these lectures. To conclude, diaphoretics, though doubtless much misused, are among the important remedies in the treatment of most of the diseases of our every day practice.

DILUENTS.

Watery liquors which increase the fluidity of the blood, and render several of the secreted and excreted fluids less viscid. Water, as has been correctly remarked by Dr. Murray, is the only proper diluent: but different substances are added, not to enhance its properties, but to render it agreeable or demulcent. The different mineral waters natural or artificial; toast and water slightly acidulated with vinegar, currant or guava jelly, tamarinds, barberry, dewberry, blackberry and raspberry jams; weak lemonade, apple-water, orange water; barley and rice water, so weak as to be simply clouded by the barley, grain, or rice meal; and numerous similar preparations which vary according to the facility of procuring, and popular predilection for, certain acid and acidulous fruits —are all diluents. It need not be remarked that they all contain principles of nutriment; and are hence peculiarly important in practice where, from the inflammatory nature of the disease, it is important to avoid the stimulus of solid nourishment. Nature indicates the propriety of administering these articles, and in a state of coldness too, in all febrile diseases, which are attended generally with excessive thirst. It is supposed they act beneficially by diluting the chyme and the chyle, and also the bile in the intestines, by which dilution it is rendered less acri-

monious. However this be, it is indubitable that diluents are important aids in the cure of many febrile complaints, and should never be lost sight of by the practitioner. When given warm, they aid in a striking manner, the salutary operation of other remedies, as diuretics and diaphoretics. They are useful in all urinary disorders, relieving ardor urinæ of gonorrhœa, and the pain of strangury. When this affection occurs in consequence of inflamed bladder, it is obvious they are well calculated to promote the healthy restoration of the part, by obtunding that acridity of the urine increased to an intolerable degree by the general febrile excitement of the system, in which the kidnies sympathise. Formerly great errors prevailed in reference to the propriety of giving cold drinks in fevers, of whatever kind: but in our day the rational observance of the calls of nature, in a diseased state of the system, has secured to many a thirsting patient, suffering from the exacerbation of an ardent fever, that salubrious and grateful *medicine* a glass of cool water; and physicians are no longer incredulously listened to when they accede to a patients request for this beverage, by stating to the attendants, that it is a proper and requisite pabulum for his feverish system wasting from the devastating inroads of a burning fire within. Who that has ever felt the assuaging effect of this remedy, under such circumstances, would deny it to his patient? The only modification of diluents, in the treatment of febrile diseases, necessary to be observed by the practitioner, is in reference to the quantity given at one time, where the stomach is irritable, and might endure a little, but would reject much, of any fluid, unless exhibited at frequent intervals: and also to avoid giving them cold, when the skin is open. In this state of the body, if it be

desirable, from the previous dryness and heat of the skin to keep it free, diluents should be given tepid: and, if we desire to keep up the diaphoretic action, they should be given warm. The use of copious draughts of warm water in promoting the operation of an emetic, is well known: and indeed, by distension alone, with this fluid, vomiting may often be very serviceably excited and kept up until the quiescence of the stomach under the last draught, indicates that all is well. More of this subject in another and more proper place. In short, diluents are important *remedies:* and the practice of that great physician so keenly satirized in Gil Blas, under the name of Dr. Sangrado, and who cured all diseases by bleeding and warm water, was not justly obnoxious, at least in my opinion, to the severity of the satire. The diluents here noticed constitute the class of attenuantia, or attenuant remedies, of Cullen: and. disposed in some rank or other. they will be found to occupy a stand, in all systems of classification. Cullen has refered to his class however. articles which I cannot deem true diluents; he first sets down water. and then follow (with some qualifying remarks of his own, sustained by the experiments of Sir John Pringle,) alkaline medicaments. neutral salts, (with his opinion of doubtful claim.) soap, sugar, honey, liquorice and the dried saccharine fruits. The last four are properly referable to demulcents, and thither I discharge them.

DIURETICS.

Medicines which increase or promote the action of the urinary organs. They do this by various occult modes of operating, and are characterised by much uncertainty. The precise course by which the impulse of these remedies or agents, reach the kidnies, so as to establish there an increased excitement of their secerning function, is by no means clearly ascertained: and it seems questionable from the very nature of the subject, whether it ever can be satisfactorily resolved. Speculation, grounded on close observation of their physiological and curative effects, has not been wanting. Much ingenuity and talent has been expended on the jarring and irreconcileable facts involved in the agency of these medicines; and still much of what is generally received as established truth, in reference to the manner of operating, remains, if not absolutely conjectural, at least far from independent of disputation. The different original opinions promulgated by publication and taught in schools on this point, may be reduced to:—

1st. That which supposes that diuretics enter by absorption into the course of the circulation, where after a time they are applied to the kidnies, which are thus, by their agency, stimulated to increased action. This was the idea of Cullen, taught in his lectures, and maintained in his work.

2d. That which supposes their action independent of absorption, and ascribable to a sympathetic action either upon the lymphatics and upon the kidnies, or upon both; the primary impulse being given to the stomach. This was the idea of the late Professor Barton, and always taught by him in his lectures on the Materia Medica, for twenty years. He extended it to the generality of diuretics, and opposed the theory of Cullen. Yet, though he did not admit the absorption of cantharides, digitalis, squill, &c. &c. he believed that some few of the class might be thus taken into the circulation, as rhubarb and madder: and always admitted that some of the saline particles of the neutral diuretic salts, might, and in all probability were, taken into the blood-vessels by the lacteals. Dr. Chapman has adopted the theory of Dr. Barton; taught it in his lectures on Materia Medica, and it appears in his publication on therapeutics: discarding as Dr. Barton did, Cullen's theory of their absorption with preservation of their individuality of diuretic power, into the blood vessels. Dr Chapman's intrenchment of this theory however, by the bulwark of moral and physical causes, operating as diuretic agents, appears to me not only futile and unphilosophical, but unrequired by any inherent imbecility of the theory itself. The operation of moral and physical causes on the corporeal functions, bears no analogy to the medicamental stimulus of extraneous substances introduced into the system. The emotion of horror and disgust at the sight of a dissected cadaver or a cancerous ulcer or a surgical operation, on sensorial sensibility as yet unreconciled to such objects, which is a moral influence—and a crowded and overheated apartment which is a physical one —both occasionally act on the physiological system

so as to produce a sickened stomach and vomiting, in which all the phænomena occur pertaining to the inverted act of the stomach by an emetic introduced into it. Yet it would not surely be correct to reason on the modus operandi of medicamental emetics introduced into the system operating in whatever way, by their *material* presence, from any effect which horror or disgust or foul air evinces, on the disturbed sensorial function, involving sickness and vomiting in the instances given. The vomiting under these circumstances, is effected by an *immaterial* agent inscrutably called into action by an untouched, or distant material object of disgust, or a partially poisonous inhalation of the lungs.

The third opinion relative to the operative manner of diuretics, is a participatory junction of the two preceding. It supposes that some diuretics operate after the first mentioned manner, and others after the second mode. Many support this two-fold theory. Dr. Eberle has adopted it in his elements of therapeutics and Materia Medica. This joint opinion maintains still less unity of action. It supposes

1st. That some diuretics act primarily on the urinary organs, in two ways. *a* by stimulating the secreting vessels of the kidnies, by *contact*, while the substances themselves are unsusceptible of decomposition *in transitu*. *b* By thus stimulating the renal vessels, undergoing decomposition *in transitu*.

2d. *c* That others act primarily on the absorbents, and secondarily on the kidnies.

3d. That others again act primarily on the stomach and first passages, and secondarily on the absorbents, which is effected in three different modes of action. *d* By diminishing arterial action

and increasing that of absorption. *e* By increasing the tone of the body in general, and that of the absorbents in particular. *f* By producing catharsis, and thereby increasing the action of the exhalents *directly* and that of the absorbents *indirectly*. It will readily be perceived, that this fourth supposition of the mode of action pertaining to diuretics, embraces the three first theories. And in truth though still, (from anomalous effects which occasionally are presented by the operation of this class of remedies irreconcilable to it,) liable to objections—it is by far the best digested theory. It seems to meet, too, more than either of the others, the physiology involved in the operation of this mysterious class of remedies. For these reasons I adopt it, and shall pursue the arrangement of the different diuretics predicated on it by Dr. Paris.

To *a* therefore will be refered, potass, nitrate of potass, oil of turpentine, juniper. (berries and its spirit gin) cantharides and the like. To *b* acetate of potass, super tartarate of potass, squill, colchicum, balsam copaiva, tops of spanish broom, (spartium). To *c* mercury. To *d* digitalis, tobacco and the like. To *e* the bitter tonics, &c. &c. To *f* elaterium, jalap and the like.

Of the simultaneous exhibition of acidulated diluents with diuretics, to ensure and promote their action. Of the circumstances and condition of the system which retard diuresis, or prevent it altogether from following the exhibition of its medical agents—as the state of the skin, the bowels, the blood vessels, the weather, clothing, &c. &c. Rules for giving these remedies.

OF THE MEDICAL USE OF DIURETICS.

These remedies are important in many diseases, but chiefly in all the varieties of dropsy: diluent drinks necessary aids here. They are employed beneficially in all diseases of the urinary organs, nephritis, gout, sometimes in rheumatism. Combined with sudorifics they have been said to be very serviceable in pulmonary diseases. Used in ulcers of the legs attended by œdema, in scurvy, elephantiasis.

EMETICS.

Agents capable of inverting the natural action of the stomach, so as to cause an ejection of its contents by the mouth.

This is their primary effect, and there are certain emetic substances, the operation of which ceases by producing it.

Their secondary effects, chiefly observed to follow what I would call searching emetics, are:

1. The inverted or upward peristaltic action of the duodenum and even the upper portion of the jejunum, by which their contents are thrown into the stomach, and thence by its continued inverted action ejected by the mouth.

2. The impulse conveyed to the gall bladder, and biliary ducts, by which their contained bile is directed into the duodenum, thence to the stomach and upward and outward as before.

Their proximate effects, are:—

1st. An abatement of the force of the general circulation, and a restoration of equilibrium to its impulses.

2d. A consentaneous relaxation of the cuticular vessels, by which the skin is opened to a diaphoretic action.

3d. A relaxation, owing to the impulsive action of the respiratory organs, of the turgid and inflamed vessels of the exterior surface of the bronchia and trachea, by which expectoration of their contained healthy or morbidly increased mucous secretion supervenes.

Their proximate consecutive effects, are:—

1st. An increased downward peristaltic action of the intestines, which is produced by some emetics in a greater degree than by others.

2d Temporary languor of the physical and moral system.

3d. Profound sleep. and subsequent healthy reaction—transient, or more or less permanent, in proportion to the intensity of the existing diseased actions for which the remedy has been prescribed.

Their remote consecutive effects. are:—

1st. An increased circulation in the liver, owing to the general impulse given to the abdominal viscera.

2d. Invigorated powers of digestion, (unless the emetics have been too often repeated.)

Their durable consecutive effects are:—

1st. A resuscitated energy of the previously depressed mental faculties, (unless much morbid cerebral excitement had prevailed.)

2d. A Beneficial change in the moral constitution of the individual. perceived in a greater or less degree. in proportion as his temperament should be choleric or billious, or phlegmatic. The irascible becoming less peevish and ireful, the man of phlegm less heavy and churlish. To recapitulate: I have arranged the effects of emetics into

1. Their primary,
2. Their secondary,
3. Their Proximate
4. Their proximate consecutive,
5. Their remote consecutive,
6. Their durable consecutive.

All of these. however. have reference in point of time. from the first vomiting act, to a few days or a week. or at farthest two weeks. After this the curative and healthy impulses of the act of full vomiting may be supposed to have passed away and the system to have returned to its usual routine of susceptibilities of ordinary health, dis-

order or disease. These effects too are drawn from the action of full vomiting on a system rather disordered than diseased: and, in so far as the fourth extends, may be considered faithful even in diseased as well as disordered systems which may require one repetition or more of the remedy. The fifth can only refer to systems slightly disordered, or to valetudinarian constitutions, in which cases the emetics require to be now and then repeated.

Having thus given a definition of emetics, by a detail of their effects, I proceed to state that it is a numerous aggregation of agents, acting by multifarious peculiarities, and should, in my opinion, be disciplined. For want of a better division I shall separate these vomiting agents into three classes. and each class into sections. The first two classes and section *d*, of the third class, embrace those agents employed medically, in acute, and such chronic diseases as are usually deemed tractable. The residue of the third class embraces those agents resorted to in obdurate chronic diseases, and never in acute disorders.

CLASS 1.—Those which act primarily and idiopathically on the stomach, comprising three sections.

§ *a*.—Such as produce this effect independently of nauseous taste or flavour, or the stimulus of over-distension from quantity, or unusual temperature.

§ *b*.—Such as produce this effect independently of nauseous taste or flavour, but by the stimulus of over-distension from quantity and unusual temperature.

§ *c*—Such as produce this effect by

uniting a nauseous taste or flavour, with the stimulus of distension from quantity and unusual temperature.

Class 2.—Those which act secondarily or sympathetically on the stomach, by continuous or direct sympathetic impulse from parts connected by structure and office with it, as the seat of primary impulse.

The subjects of this class are mechanical agents used to induce vomiting by the stimulus of irritation to the fauces and gullet.

Class 3.—Those which act secondarily or sympathetically on the stomach. by reverse sympathetic impulse from the brain or nervous system, as the seat of primary impulse:

§ *d*—Such as produce this effect medically, being substances termed medicaments; or articles of luxury, acting on the physiological system unaccustomed to their stimulus; and ceasing to invert the action of the stomach when reconciled to it by habit.

§ *e*—Such as produce this effect physically, being *natural* agents acting on the physiological system unaccustomed to their stimulus; and ceasing to invert the action of the stomach when reconciled to it by habit.

§ *f*—Such as produce this effect physically, being *artificial* agents acting on the physiological system unaccustomed to their stimulus; and ceasing to invert the action of the stomach when reconciled to it by habit.

I have not proposed this division of the class of emetics, from any desire to offer something entirely new, which it is, but because an attentive consideration of the immense number of important agents usually thrown into one group under the head of emetics, has led me to believe a philosophical view of their various effects and modes of action, would lead the student to a more extended regard of their inestimable use, than if they are, as is always done, grouped according to the unity of their physiological effect. It presents their powers to his mind in such various lights and shades, so disposed, that the mind's eye can rest on that distance or object of the entire picture, which may suit his contemplative and reflective powers, in times of need. For he will assuredly find, in the course of his practice, ample occasion to be well versed in all the varieties of this important assemblage to adopt some one or more of them to the exigencies and peculiarities of the subjects for their operation. The physician who confines his ideas of emetics to the simple effect of tartar emetic or ipecacuanha is but rudely versed in the philosophy of his profession; and I will go farther, is but slenderly stocked with requisite knowledge of one of the leading and effective parts of his art. This subject will be extensively canvassed in the lectures. In the mean while it may suffice to give examples of the different classes and sections of emetics, first proposed.

CLASS 1. § *a*—Tartar emetic, sulphate of copper and the like.
§ *b*—Warm water and the like.
§ *c*—Weak infusion of mustard, horseradish, chammomile flowers, car-

duous benedictus, strong infusion of green tea, boneset and the like.

CLASS 2. The probang, and finger, to the gullet: feathers and straws to the fauces.

CLASS 3. § *d*—1. Narcotics, as opium 2nd tobacco taken as snuff, as a masticatory, or inhaled by smoke.

§ *e*—Overheated apartments and the like; violent *running*.

§ *f*—Super-abundant *clothing* unappropriate to the season or weather; the *warm* pediluvium and *warm* bath; sailing, swimming, *riding* backward in a carriage, whirling and the like.

The stomach is not only sickened and propelled to vomiting by emetics, but there are moral impulses which produce the same effects on the physiological system, by acting impetuously on the mental sensibility, and thence by reverse sympathetic action physically on the stomach. For example: sudden gushes of the depressing passions: distressing intelligence; sudden disappointment of long expected good; judicial sentence of death, or reprieve; sudden injury done to those we love, beyond the mind's impulse of probable controul or relief, within our power. The sight of disgusting and repulsing objects: as cadavera and dissections, &c. &c.

The last observations are made here simply to call to the student's mind, that there are susceptibilities of inverted action in the stomach, in some persons, far greater than in others: and generally, those liable to be thus morally affected, are, from their mawkish sensibility easily acted on, by any of the preceding classes of emetic agents.

Having thus stated the effects of emetics and the susceptibilities of the system to an inverted action of the stomach, I proceed to consider by what dissociated or perverted train of actions, the impulse is achieved: of what in other words has been called, and most incorrectly and unphilosophically, the mechanism of vomiting. Different opinions are entertained on this subject, by physiologists. Whatever difference of opinion however may have existed or may still exist, in relation to the catenated actions necessary to produce vomiting, most writers seem to admit that it is a complicated process. Among those who have maintained the unity of action, is Majendie, who attributes it altogether to the agency of the brain, and regards the stomach as a passive instrument in the act, directed mechanically to its inverted propulsive effort, by the abdominal muscles stimulated to a peculiar action by the sensorium. His experiments as detailed in his memoir to the Royal Institute of France in 1812, noticed. Dr. Paris appears to lean to this assumption of sensorial influence, to explain this act; but by reasoning which I cannot deem valid. He observes that wounds and contusions of the head, of such violence as to suspend sensorial energy: and profound inebriation, which has, for a time a similar effect, —both render the stomach inaccessible by the artificial stimulus of emetics however vigorously used. But that in incipient intoxication, and under circumstances of less violent wounds or contusions of the same part, the "irritability of the stomach is less paralysed, and vomiting under such circumstances is excited by the slightest causes." I assume it as a fact grounded on my own observation of numerous cases of violent wounds, and forcible contusions of the

head, that the shock to the system is universal. They do not produce a singleness of paralysed condition in any one organ. The brain, the nervous system, the catenated actions of respiration, the stomach, the bowels, the cutaneous sensibility, the voluntary and involuntary muscles, even the action of the heart and arteries.—all participate in the concussive injury, at least for a time, which is of longer duration, or shorter continuance, in proportion to the degree of intensity of the violent injury. Is it therefore to be argued, because, in this condition of the whole system, the stomach obeys not the artificial presence of an unusual stimulus as of the emetic with which it may be forcibly gorged, that it does not evidence its retrocessive action, because that action depends on the brain, which, in these cases is palsied? The stomach in its actions, doubtless sympathises with the harmonious equipoise of all the parts of the general whole; and certainly does sympathise especially with the brain; but when all these parts are thus invaded by a concussive injury, how can its quiesence under the presence of an emetic, be refered, singly, to the injurious invasion of the cerebral and nervous functions? This is assuming what fact will not warrant; and does not prove that vomiting depends on the brain. I apprehend a similar universality of dissociated, or suspended actions, takes place in profound drunkenness. The paralysing influence of the narcotic spirit, not only places the healthy functions in suspension or temporary paralysis, but it does so universally. And if, from any idiosycracy, the brain should partake less of this paralysis on its powers of reasoning, than in its ability to controul or direct the voluntary muscles, as is not unfrequently the case—the stomach is in such cases

equally insensible to the stimulus of an emetic, as when a total loss of sensorial power accompanies the obtunded or paralyzed corporeal functions. This could not be the case, if Dr. Paris' position were true. Neither can I see reason to admit, that in case of incipient intoxication, or slighter wounds, or contusions of the head, the stomach is in a state of such increased excitability, that "vomiting under such circumstances is excited by the slightest causes." Who has not observed spontaneous vomiting to occur frequently in cases of excessive intoxication? And who does not know that vomiting, accompanying, or soon following a wound or contusion of the head, affords an indication of the great violence done to the brain, and from which indeed an unfavourable augury is generally, and seldom incorrectly derived?

Dr. Chirac also conceived the stomach, to be a passive instrument under controul of the abdominal muscles and diaphragm in the process under notice, as much so as a glyster-bag under pressure of the hand of the operator, in throwing the contents into the rectum. Some French writers declare the abdominal muscles unrequired to effect vomiting: and that the contents of the stomach can be discharged after their action is taken away. Rosenstein and Schulze believe the stomach to be universally active, but that the diaphragm by its compression of that viscus, causes puking. Mr. Haighton's experiments noticed. He believed from them that the diaphragm and abdominal muscles are essential and effective; but that these unaided by the stomach itself as an active agent, cannot induce the action. Both are therefore, in his opinion required to operate in unison. Dr. Brian Robinson's and Cullen's theories noticed. Mr. John Hunter's sympathetic theory of the effect of vomit-

ing in hernia humoralis. stated. Opinion of Darwin respecting the cause of vomiting. Experiments and opinions of M. Maingault, Professor Portal, M. Bourdon, on the same subject. In short, the physiology involved in this mysterious but natural, though not customary action of the stomach, must from the very occult nature of the process, be chiefly speculative. The phænomena are visible enough; the cause or causes of them involved in much obscurity; and, though well devised, and judiciously conducted experiments have been instituted by ingenious and qualified physiologists, to elucidate this process, still its ultimate results are all that are indisputably known. A more useful subject of enquiry to the student, will be found in the study of the phænomena, effects, irregularities, and therapeutic application of the agents usually employed to effect the important susceptibility of the stomach to be evacuated of its contents: and of the general system to be curatively or beneficially approached by that evacuation, through effects produced by it. To a discussion of these points I shall therefore pass on, after noticing some miscellaneous facts embraced in the general view.

The function of vomiting, is natural to man and various brute animals. Birds vomit, particularly the carnivorous birds of prey. Fishes vomit, and some amphibia. Of the mamalia, the horse cannot vomit or be artificially made to do so. The reasons for this deduced from his anatomical structure: vomiting sometimes dangerous; in what kind of systems and temperaments to be cautiously resorted to. In what diseases dangerous. Rupture of the œsophagus has been produced by it: instances given. Comparative ease of the operation to

infancy, adolescence and age; phænomena of vomiting described.—Of sea-sickness.

This may be a proper place to take some notice of *nausea maritima*, or sea-sickness; an affection attended with much vomiting at times.

Having drawn up some account of the phænomena of this affection when at sea, I subjoin them here from my notes to Gregory on Climate. It will enable you, should you enter on practice without having experienced or witnessed this affection, to know in what cases sea-sickness may be resorted to as a therapeutic agent.

"When a person goes to sea for the first time, he is commonly affected immediately upon his *coming into blue water*, as sailors term it, with slight giddiness of the head and a sense of tightness across the forehead; considerable and distressing nausea; a sense of motion in the stomach, and soon after violent, copious and convulsive vomiting. These effects generally continue for a few days, during which time they are most aggravated by an upright position of the body below decks, and less severe while inhaling the free air on deck, and in an horizontal position of the body when below. The nausea is always painfully increased by the odour of cooked meats; and especially by the disagreeable and peculiar smell of the bilge water pumped up at a regular hour, every evening. The odour from this putrid water is so nauseous and subtle, that it insinuates itself into all parts of the vessel: and while its power on the surrounding air is at its height, it equally affects with disagreeable feelings, the veteran seaman and the tyro in sailing, producing on the latter however, infallably, the most violent and convulsive puking. The motion of a vessel through the water is vehement,

rapid, sometimes irregular, and in turbulent weather, much interrupted by sudden lurches. That a violent commotion is communicated to the system by these combined motions must seem evident to every one, but the peculiar effects and operation of it upon the mind and body of the person who may be the subject of it, can only be thoroughly known by those who have experienced it in their own persons. It must seem clear however, to every reflecting mind, that as this motion of the vessel is constant, though in a greater or less degree, a person at sea must be sensible of some permanent effect on the system, liable to to augmentation and diminution in proportion as the weather is calm or turbulent. This accordingly is the case, and there are few persons who are not affected by costiveness, not only immediately after going to sea, but in some degree subject to it all the time they continue there. This effect I believe to be in no way dependant on, or in consequence of the peculiar aliment that is generally eaten at sea. but owing solely to the continual impulse communicated to the stomach and intestines by the rolling, tossing about and pitching of the vessel. I infer this from the fact, that this costiveness exists in a greater degree, in persons sailing in small vessels, of which the motion is short, quick, and pitching, than in larger vessels, as in frigates, where it is long and less often repeated in a given time. Now though the more violent affection of the stomach for the most part goes off after four or five days, or at farthest in a week or ten days, there is nevertheless a certain kind of affection of that organ, and which indeed is in a degree communicated to the system generally, that comes on during every heavy blow. A sensation is felt when the ship lurches or pitches

forward as if one was falling, and upon the rising of the vessel upon the waves again, as if one was raised with it. This sensation, which is felt in the greatest degree when there is a cross or head sea, or when the ship, going before the wind, lurches from side to side, communicates to the abdominal muscles a convulsive and sudden action, so that the whole contents of the abdomen are compressed and expanded alternately with the rising and falling of the ship. This compression consequently operates on the diaphragm, forcing that muscle upwards in the same violent and convulsive manner, so that the viscera of the thorax are also sensibly compressed and expanded with the lurching and righting of the vessel. These effects as I have before remarked, are produced with every new turbulence of the sea: and as they are totally independent of the nausea and sickness before mentioned, may be considered as the more permanent effects of sailing. One other effect of the vessel's motion, is the constant and novel action of the muscles of the body, principally those of the lower extremities, to preserve an equipoise and prevent falling The centre of gravity constantly altering as respects locality, a continual and corresponding action of the muscles, to preserve an equilibrium, is of course necessary; and this continual action of the muscles, novel, sudden and energetic, is the most permanent of the effects of sailing. It is the exercise arising from this action of the muscles, that brings such invigoration to the debilitated patient, and this action never ceases to be necessary during the slightest motion of the sea, except in a horizontal position of the body, and even then, in blowing weather one is frequently awakened from sleep by an involuntary exertion to avoid being thrown from the berth. I have uniformly observed that those per-

sons who were slightly affected, or affected not at all, with vomiting, or nausea, suffered excessively from an affection of the mind, and frequently from acute pain in the head, which was always considerably aggravated by the violent pitching of the ship. Such are the effects of sailing upon the system as I have observed them, both in small vessels as packets, sloops of war, and in larger ones as frigates. I have never witnessed but three very distressing cases of sea-sickness, one a landman on board of the frigate United States, in whom great emaciation, loss of appetite, and a habitual convulsive retching, which continued after the ship came to anchor: and the other two, which were on board of the Essex, are particularly mentioned in my "Treatise on Marine Hospitals, &c." p. 153.

"The exercise of sailing is not only performed in a fine healthy and pure air, but it is constant in itself. The veteran seaman has the same continual action of nearly all the muscles of the body, perpetually exerting its salutary effects on the system, as the young sailor is subject to. But the mind loses in the first instance, by the influence of habit, its consciousness of this continued exertion of the muscles. In the latter case the exercise and consequences of sailing, are so novel and positive, that the mind dwells on them with more attention, until time and habit produce also on the new sailor, the same unconsciousness of the perpetual exertions of the body to preserve its proper position, and to prevent falling prostrate with every pitch of the vessel. The same unconsciousness of the operations of the mind and the synchronous action of the muscles of the body, takes place in many of our common actions, which from long practice are so adroitly performed that we frequently are inclined to believe them, and they

ordinarily appear to others, to be involuntary: Thus for example the successive rapid and almost imperceptible movements of the fingers, and the synchronous actions of the muscles of the tongue, mouth and lips, in playing on the German flute, seem after long practice, to be independent of any act of the mind, since we are inclined to think it cannot produce such vehement and rapid operations. Yet here, each movement of the fingers and every action of the muscles before mentioned, are the effect of a distinct and vivid act of volition."

"This continual exercise of the muscles then when a ship is under sail, and which I have before remarked is in some measure performed even during sleep, is one of the most salutary effects of sailing. By means then of this gentle and regular exercise, the circulation of the blood is vigorously promoted through every part of the body, producing so healthy an action in the minute vessels of the surface, that a uniform and copious perspiration is effected. This is carried off as fast as it is exhaled from the surface of the body, by the change of atmosphere and the perpetual succession of its stimulating effects on the skin. Hence it is that there is always so intense and impatient an appetite felt at sea: for the food taken into the system after undergoing the customary alterations, speedily pass off, that is, the liquid portion of it, by perspiration."

MEDICAL USE OF EMETICS.

Probably among the earliest remedies, from an observance of the beneficial effects of spontaneous

vomiting. Savage nations well acquainted with these. Of the prejudices against emetics. Important remedies in febrile diseases in which their use is of ancient date. Preparatory to the bark and quinine now much used: reasons why; of their use as nauseatives and diophoretics, in intermittent and remittent fevers. Indicated or contra-indicated according to the character of the climate, and state of the season. An enquiry whether emetics may be safely used in cerebral diseases? or disorders with cerebral determination? Of their use in epilepsy; also in apoplexy. Supposed injurious in hydrocephalus. Useful in dysentery; ipecacuanha preferable to antimonials as recommended by Sir George Baker and others, or vitriol commended by Mosely. Of their use in diarrhœa; in cholera infantum. Of Richter, Franks and other German author's recommendation of these remedies in diabetes. They are employed in acute rheumatism; in what manner they can do good here, stated. In regular inflammatory gout; their efficacy doubted. Scudamore opposes their use, except under certain circumstances detailed. Of the emetic powers of *eau medicinale*; how much of its good effect in gout depends on this property. Of the curative powers of emetics in sick-head-ache. Serviceable in gutta serena and inveterate cases of opthalmia. Dr. Sanders'. Dr. Robert Dawson's experience in opthalmia. Sir Wm. Adams used them in opthalmia of Egypt. How they promote absorption. Have been used in dropsies; anasarca and ascites, especially. Of diuretic emetics in these diseases. Of Lieutaud's prescription in hydrothorax. Benefits from emetics in jaundice and obstructed biliary ducts. Of their efficacy in exanthematous diseases. Are indispensible in croup. but never to be depended on to the exclusion of bleeding, except in slight

cases. Of their effect in combination with other remedies in cynanche maligna necessary; often repeated, in hooping-cough. Of their effect in typhus pneumonia. Of Dr. Armstrong's and Dr. Potter's experience with emetics in typhus. Of their efficacy in hœmoptisis; of Dr. Cullen's distrust of them in that hæmorrhage. Of emetics in asthma. Have been much used in consumption. Imitations of sea-sickness by certain emetic treatment; nugatory; reasons why. Emetics useful in forming stage of phthisis pulmonalis. In certain cases of palsy, emetics have been much used. Of the dry-vomit; its peculiarities. Dr. Herberden's opinion, that in hemiplegia we should in no instance excite vomiting by strong medicines; he thought them useful by appeasing nausea, and removing offensive substances from the stomach The French physicians are very partial to the exhibition of these remedies in this disease, and place great dependance on them. M. Serres and M. Lerminier used solution of tartar emetic in large quantities of water. The use of emetics in hemiplegia not common in Britain. Of the efficacy of these remedies, in that disease there are numerous writers who advocate, and as many who condemn them. Sydenham, Forthergill, Pitcairn, Kirkland, Selle, Crowfoot, Catherwood, Burserius, Quarin, and Sir Gilbert Blane, and in fact numerous other authors of less note, have advocated their employment: while others contend they are injurious and dangerous, among whom are Cullen, Langslow, Cheyne, Forestus and many others. Of the detumescence of scrophulous tumors by emetics and sea sickness. Of Mr. John Hunter's treatment of hernia humoralis by emetics. Of the cutaneous diseases in which these remedies have been used beneficially. Of their application as anthelmentics, in cases of erratic worms; of their application as emmena-

gogues. Very important remedies in maniacal and morose hyteria. Of the application of emetics in cases of strangulated hernia ; and obdurate luxations. Of emetics in mania, hypocondriasis, and in puerperal mania. Of Dr. Joseph Klapp's treatment of mania á potu, by emetics. An enquiry into its comparative efficacy with the narcotic treatment. Dr. Klapp's opinion. that narcotics are inadmissible except in cases of complete exhaustion or hyper-catharsis, from the operation of emetics acting on the bowels. Others advocate opiates after the vomiting. Remarks on the difference of treatment of this disease by physicians. Of the importance of emetics to relieve infantile indigestion ; ipecacuanha the best. These remedies prevent and relieve convulsions depending on this cause. Equally necessary to relieve the stomach of a surfeit. Of their efficacy in gastric debility, owing to excess of acid, followed by antacids and mild pure bitters, like calumba. Even in obstinate constipation are salutary, and of ancient application. Stoll, Sims, Sumeire, Deplace, Dr. Hosack, and other authors highly commend them in torpor of the alimentary canal. Emetics have been recommended to prevent constitutional injury arising from the bites of venomous serpents. Sprengel's account of cases of the bites of Italian vipers, cured by these remedies. In conclusion: the varied employment of the articles and agents of this class, constitutes an important and essential part of the curative art of medicine ; and they are the most active and indispensible agents in Toxicology. A notice of the peculiarities of operating, pertaining to the different emetics ; the importance of the student informing himself on these points.

Finally: of pumping the stomach ; the different instruments and apparatus for this purpose. The

cases in which it may be preferable to awaiting the operation even of the most impetuous emetics. Of the mode of using the apparatus, and the absolute necessity of being well acquainted with the mode of using them, and of adroitness in the operation.

EMMENAGOGUES.

Medicines and agents which excite and promote the menstrual evacuation; it is supposed they are capable of effecting this, when that flux is retained or suppressed. This class is still retained by writers on medicaments, notwithstanding the acknowledged faithlessness of the restorative agency of the articles in the disordered function of the uterus, for removing which they have been supposed specifically appropriate. Among those who most deprecated the idea of such specific action, was Cullen. He has unequivocally expressed his doubts of the existence, in any medicine then known, of a peculiarity of action tending to affect that organ in any especial manner. The older writers, however, have swelled their books with long lists of articles under this appellation. When we advert to the variety of causes which have an agency in the retention of the meuses at a period of life when they ought, in the natural course of physiological action, to appear; or, when having, in due time made their appearance, have become morbidly suppressed; when we reflect how widely discrepant from any thing like unity, these causes embrace; and that they are as frequently moral as physical and morbid,—we cannot surely, without great circumspection and hesitancy, admit that material agents of a medical nature, are adequate to remove the evil, from whatever source originating; or lessen its prejudicial influence on the gen-

eral system. Much less forward should we be to admit that they do this, even when they effect it, by any specific agency. Our reluctance to admit the reality of such powers in material substances, is justified by the experience of any one whose opportunities of practice with them, have been frequent, with aim at their usually accredited power, in cases at all difficult, perplexing or obdurate. It requires but an ordinary share of observation to detect the fallacy of any remediate expectation founded on an idea of specific agency or determination of effect on the uterus. At least this remark may very safely be extended to nine tenths of the substances and agents employed as emmenagogues. The action of even the remaining tenth part, is not so strikingly and unequivocally marked by such unerring and peculiar action, as to demand for them the epithet of *specific* agents. I am borne out in these observations by the majority of practitioners of ten years standing. My own conviction of their truth, together with my belief in the fruitful production of uterine derangements by pure moral causes more than physical, has fixed my belief in the irrationality of retaining as a separate class of remedies, numerous substances, which, if they act as the name of the class requires they should,—do so, by collateral and devious influences, from which, as a seat of action, the uterus is, in as many instances remote, as adjacent or contiguous. The class under notice has, for these reasons, always appeared to me untenable, and egregiously at variance with any of that persistency or certainty of action in its subjects, called for by its name and the assumed principle of foundation. It is no new observation, that under the head of general stimulants or tonics, and cathartics affecting the pelvic portion of the bowels, all emmenagogues may be

arrayed. Murray has suggested this long ago, but has still servilely pursued the previous track of others, in retaining the class. I shall venture to modify his arrangement by disposing of emmenagogues in a manner hereafter to be seen. In the mean while let me observe, it is no inconsiderable corroboration of the propriety of this expurgation of the unstable class, that the only medicine which beyond all disputation or denial, does exert an impulsive, sudden and *specific* action on the uterus, is destitute of the power, or at least very rarely evinces it, of sanatively reinstating the uterine evacuation, when retained or suppressed by any cause independent of conception or pregnancy. If these substances which are conjectured to act *specifically* on the uterus, did impel or promote its secreted redundant fluid, by such specific controul of its actions, where should we so naturally look for an efficient remedy in all cases whether of retention or suppression; whether of mild or exasperated character,—as to Ergot, which in a manner so plain, in a degree of force so vehement. in a time so short as to preclude any idea of circulatory absorption and hence secondary agency. proves its specific action on the uterus? Will it be said that it cannot act as an emmenagogue. because the excessive velocity and force of its action. excite a constricting spasm on the already rigid mouths of the uterine disgorging vessels? The very intensity of its action would enable us to graduate its dose to the degree of obduracy of the disturbance. It is we know, no kind of qualifying reason against admitting the emetic power of tartarized antimony, that in an undue quantity it paralizes the stomach, and kills the subject by its noxious presence, like arsenic or other corroding poisons.

That constitutional preparatory treatment is requisite to ensure the action of what are termed emmenagogues, is known by every practitioner who has attended to the subject; and it seems as necessary in using those of activity as any other. I am sustained in this by a distinguished author, whose opinion bears with peculiar force on this point, because he speaks of emmenagogues as agents of specific virtue. Speaking of the effect of *guaiacum* in restoring suppressed catamenia, and of its want of success in the hands of some of his brother practitioners, Dr. Dewees states that they had neglected to "place the system in a proper situation for its use," by the treatment he pursues; remarking that he "almost always reduces the pulse lower than for madder or cantharides; this he observes, "is easily effected, by the loss of a little more blood than in the other cases; purging more freely, and insisting on a low diet for a few days."* The doctor in many other passages, shews that these general remedies are habitually used by him *preparatory* to what he believes the specific emmenagogue, chosen for the particular case. I cannot however, but view the latter as one of the train of general remedies employed, suited by its peculiar stimulant energy, to rouse the *whole* system, and by this means its *parts*. Of the latter the uterus is one, participating in the general healthy restoration. This view by no means can weaken our confidence in the vol. tr. of guaiacum, so strenuously recommended, or, in any other medicine of similar effect. But merely adjusts what it is impossible for me to help believing. a *misnomer* of the commended remedy, which may mislead less experienced practitioners

* Dewees on the Diseases of Females, Phila. 1826. p. 79

than the author, to depend solely on its *specific* power. This indeed, appears to have been the fact in reference to this very article, with which others have failed to do what has been effected under management of Dr. Dewees, and I may here add, in some few instances under my own, simply because they "neglected to prepare the system," in other words, merely because they allowed to guaiacum a specific virtue it does not possess.

In order to form a correct estimate of the mode of operating pertaining to these remedies, it is proper to notice the sympathizing morbid derangement, mental and physical, which attends catamenial suppression or retention, the removing which must ever precede or follow a reinstated functional regularity of the uterus. It is not denied, that though a state of general debility attends this irregularity of uterine function, that numerous cases occur in which a condition of the system the very opposite exists—a plethoric state of the blood-vessels, and rigid tone of the general system. This however, does not give rise to a corresponding vigour of bodily health But on the contrary, a concealed and enervating tendency to feeble action, lurks under this deceptive full toned habit, and shews itself on the slightest bodily exertion. However different then to appearance these opposite attending conditions of uterine derangement may be; and however different the method of cure most certainly is, I assume it as undeniable that the mental and nervous system is deeply involved in both. Hysteria in all its protean forms assails both. Mental despondency accompanies both. In short, all those numberless monitions, which too faithfully announce that a general invasion of health has been accomplished, by the

disturbed and broken up condition of this central garrison—this regulating spring, of all female vigour. And it is but too evident, that unless it be timely regained and intrenched, a total loss of health and even a forfeiture of female destiny to propagate the species, will be inevitable. When the importance to the female of a restored regularity is considered; when the variety of morbid symtoms arising from that irregularity is taken into view, it is evident, that general or constitutional remedies, are for the most part, those which alone are adequate to cure a train of constitutional morbid affections, notwithstanding the single seat of original disorder. The true emmenagogues will consequently be found to be, as the case may be of lax or sthenic habit, or other condition of the system may require—the following:

1. Simple tonics particularly some metallic salts, as iron, with or without aromatics, bitter tonics; 2. drastic cathartics with or without aromatics; 3. frequent emetics, succeeded by some of the preceding; 4. blood-letting; 5. even stimulating diuretics, as cantharides and balsam copaiva; 6. and best of all, according to the experience of one of the most distinguished accoucheurs and experienced practitioners of this country,* *vol. tr: gum guaiacum.* 7. Also ptisans of some of the verticillatæ, as penny-royal, dittany, balm, horehound, marjoram, the mints, rosemary. Some of the tetradynamiæ, as mustard-seed, infusion of horseradish, &c. 8. Many of the antispasmodics, as the fœtid

* "I have for nearly seven and thirty years, almost daily used this medicine, in suppressed catamenia; and more especially in those of long standing, without its having failed in any case proper for its use—more cannot be said of a medicine."

Dewees on the Diseases of Females, Phila. 1826. *p.* 80.

gums, assafœtida, galbanum, sagapenum; castor, and other articles of this class as our native symplocarpus fœtida, &c. 9. Some sialagogues, as mercury, either used as an alterative to effect ptyalisim, or as a cathartic; 10. some of the asperifoliæ. as madder; 11. of the corymbiferæ. as tansey and boneset; 12. of the bulbosæ, as saffron; 13. of the stimulating expectorants, as senega, snake root; 14. some of the coniferæ, as savin, infusion of cedar berries, &c. 15. Many essential oils, as of rue, cajeput, cloves, cinnamon, sassafras, pennyroyal, &c. 16. some stimulating dietetic beverages, strong coffee, weak spirit of juniper, and infusion of the berries. These constitute the medical means. Then follow the physical. as exercise of different kinds, gestation, equitation and exercitation in invigorating amusements as dancing, jumping the rope, &c. Then mechanical remedies, as flesh-brush, frictions, ligatures to the thighs, &c. Then local stimulating remedies, as semicupium of salt water, the warm, simple or medicated pediluvium: general tepid, warm, and cold bathing, vapour bath, sea-bathing, fomentations to the pubes; temperate and regulated diet. Then follow moral means. These are overlooked in too many cases, which have their original uterine disturbance altogether induced by intemperate indulgence of the depressing passions as jealousy, envy, hatred, revenge; of depressing emotions as grief, disappointment in marriage, love, or excessive ambition of whatever kind. These may and often do affect the talented, the high-minded, and in society the respectable and elevated female; but a train of baser passions and emotions controuls and taints the uterine system of the lower orders, unrestrained for the most part by decency or education. These are lust and its consecutive indulgence, intemperance in the pleasures of

venus, lascivious practices of a criminal and unnatural kind; impetuous and unrestrained gusts of rage, jealousy and revenge;* reckless surrender to immoderate eating and drinking. In short the whole moral system, in its unchastened aberrations, and licentious indulgences, is not unfrequently a cause of retention and suppression of the catamenia, as well as productive often, of dysmenorrhœa, and menorrhagia. When this moral inordinancy is the morbid agent, in cases under our care, in vain will we seek material medicaments to effect the cure, without at the same time, using the restraining influence of moral castigation and reform, by our own advice or the influence of friends. I am aware that it is only the educated female whose mind is to be reached by these representations of the cause of her malady: but even the abandoned and profligate do sometimes surrender their vices at the shrine of health. It is our duty to aid such in their return to a less vicious life.

From the preceding view of the causes of uterine derangement and the various means of palliation and cure, for palliation is not unfrequently all we can effect; it is plain, that as I have advanced in the outset, they act by any thing but a specific force directed to the uterus, and it is equally clear and conclusive, that there is no just or even rational foundation for the existence or retention of such a class as emmenagogues. Such at least is my view, and such my reasons for it. As it is my duty to teach what I believe, I therefore instruct the student to dissociate from his mind in the study of medicaments, that unphilosophical and misleading class. He will find it thrown out of Murray's

* These also produce menorrhagia.

arrangement at the end of the section A of these lectures.

It may be proper here the better to understand the force of the preceding outlines, to state, that the disgorging office of the uterus, expels a fluid which was formerly deemed a simple evacuation of redundant blood from a plethoric viscus, obeying the vicissitudes of lunar influences, venereal desires, concoctive fermentation, &c. &c. Among the distinguished writers who deemed this discharge a periodical hæmorrhage of a plethoric viscus was Cullen. The opinion which refers to the uterus a glandular office, and esteems the catamenia as the secreted product of that secerning function, and as a fluid of *unique* properties, is now entertained by many physiologists. The originating of this theory has been refered severally to Bordieu, Sanders and Mr. John Hunter. Dr. Craven's, inaugural dissertation published in Edinburgh in 1778, which I have not seen, is said to contain it. It is found in Bordieu's "Traités des Glandes," and Allen in his synopsis medicinæ, develops it, as the theory of an author not named by him. But it is an opinion of much earlier date, than the period at which either of the authors just named, wrote or published. It is clearly promulgated in the work of Rammazini as early as 1770, and he speaks of it as nothing new, and without claiming to himself the fact of having originated it. Dr. Dewees, who contends for the existence of a mucous lining of the uterus, with the power of performing what mucous membranes do perform elsewhere, does not believe that the catamenia are "a mere exudation from the internal surface of the uterus, constituting a species of hæmorrhage," but to be a "*genuine secretion*," from that membrane. He believes the change wrought upon the coagula-

ting lymph of blood from the common mass determined to this part, by which alteration it is deprived of its *susceptibility* of coagulation, is owing to "some peculiar mode of arterial action," similar to the alteration which takes place in the blood from the presence in the system of scurvy, yellow fever and small pox, &c. or death from a blow on the stomach. Hence he infers that as "the same effect" (the eradicating of coagulating susceptibility) "is produced by the uterine arteries during the menstrual process, this process may, with much propriety, be termed a secretory process." Without at this moment stating my own views of the menstrual blood, (for blood I still believe it) in reference to the secretory process by which it is supposed to be engendered, I beg here to deprecate this mode of reasoning on the cause of a physiological healthy and natural function, by *unnatural* (or morbid) physiological results, which owe their institution to an extraneous cause inimical to healthy function,—to a cause absolutely morbid, as the effects which follow that cause. It appears to me a mode of false reasoning, for its data have no relevancy to the point at issue; however correct the inference from the insulated facts pertaining to the diseased condition spoken of, may be. That small pox, scurvy, yellow fever and a blow on the belly, are followed by an anomalous, and surely a morbid change in the coagulating property of the blood, proves certainly that diseased action can have that effect: but I apprehend can never prove, that, because a similar unsusceptibility to coagulate pertains to menstrual blood, it is hence a secretion. Such an inference would lead, and pursuing it does lead, to refering a morbid acting power in the vessels of the uterus, similar to the morbid acting power of scurvy, &c.

But this conclusion inevitably tends to a point the farthest from Dr. Dewees' opinion in relation to the flux in question—that it is a *morbid process*. In truth I cannot help thinking, that the undenied fact of material differences between common and menstrual blood in their component parts, together with the fact that no vicarious hæmorrhage is a succedaneum for the catamenial flux, has led to inferences beyond the necessity or merits of the case. That this process is not a hæmorrhage of common blood I believe: but, that it is a genuine secretion does not appear to me made out, either by the facts or arguments adduced to support that notion. Farther—more of a secreting office is assigned to the uterus, as the opinion of Mr. Hunter, than appears to me belongs to that opinion.

In an extract from his lectures which he furnished to be published in Johnson's Midwifery, he has asserted clearly his doubt of the identity of catamenial and venous or arterial blood: but from his own words it does not appear to me, by any means certain, that he deemed the catamenial discharge, an absolute secretion of the uterus; but rather as a superabundant flow of pure blood (which he deemed possessed of vitality) derived from the common source "changed, separated, or thrown off, from the *common mass*, by an action of the vessels of the uterus, in a process *similar to secretion*, by which action the blood" (the common blood in plethoric presence in the uterus) "having lost its vital principle, does not coagulate." It does appear to me, that this theory of Mr. Hunter is misapprehended by those who appear only to have glanced at it, and incorrectly suppose he admitted that the uterus was a gland *in toto*. But that anatomical glandular structure, which is seen in other parts of the system, is entirely wanting in this. And it is no proof that its comparative

destitution of a congeries of vessels which constitutes all true glandular structures, should not forbid our considering it a true secreting viscus, that "a few vessels,* creeping through the coats of the stomach, can secrete the gastric liquor." It is purely conjectural, in what manner the gastric liquor is secreted; and surely no one ever called the stomach a true gland, simply because a peculiar fluid generated by some occult process of the system, is found in it and essential to its appropriate office. The supposed analogy derived from the asserted absence of glandular structure in vegetables, which secrete nevertheless. gums, oil. &c. by the same writer,† is totally nugatory. The assertion betrays a want of acquaintance with the anatomical structure and physiology of vegetables, which should have been known before such analogical illustration was enlisted. The existence in vegetables of absolute glandular structure, anatomically analogous to glands in the animal system, is not a matter of surmise, but visible. plain. demonstrable. Nay more, the execretory ducts of these glands, and patulous extremeties of their vessels, by which in numerous instances, their gums, resins, narcotic juices, poisonous secretions. &c. are thrown out to the surface of the leaves. stems, nectaries and other parts of plants, are easily traced, by slight adventitious scrutiny, and brought fairly to view. The fistulous opening in the hairs of nettles, at the base of each of which is a gland secreting a pungent and irritating fluid; the patulous openings in the leaves of the cistus creticus, which throw out from the glands with which they are continuous, the common labdanum

* Dr. Chapman, Therapeutics, Emmenagogues.

† Dr. Chapman, *ibid.* *ibid.*

of the Materia Medica; the same structure in glaucous plants which covers them with a resinous secretion: a similar structure in the leaves of the myrica cerifera. or wax bearing myrtle, by which they are covered with a green ceratious deposition; but above all, the stucture of the nectaries of all plants, particularly in the strobiles of common hops, which throw out at the base of the squamæ, a secreted narcotic bitter resin, called by Dr. A. W. Ives lupulin; and the nectaries of the melianthus major, which contain, as a fluid is contained in a cup, half a dram or more of honey—are a few instances of thousands which might be adduced, to shew that the glandular structure not only exists in vegetables, but that it is, by its excretory ducts and other circumstances, a structure anatomically similar to animal glands. The verisimilitude is palpable. Indeed, it is not only upon the irrelevancy and insufficiency of this supposed analogy of simple structure in the uterus and in vegetables which secrete acids, mucilages, gums, resis oils, &c. that I believe too much of a glandular office is assigned to the uterus, in the production of the catamenia. There is really no sufficient foundation in the anatomy of the part, for ascribing so much of its function, to the elimination of a species of blood, different it is true in many essential points, from common blood, but nevertheless sufficiently resembling it, to have eluded the observation of many men of distinguished acumen and knowledge. The truth seems to me to lie midway between these two extremes, where indeed that penetrating physiologist, Mr. Hunter, saw it. And the kind of change effected by the agency of the uterus in common blood determined to it in a super-abundant quantity, and in periodical regularity, by some inscrutable neces-

sity of the female oeconomy, may probably be, as Mr. Hunter called it, by a process *similar* to that of a gland, but neither requiring, nor indeed receiving that degreee of refined secretion from common blood, which true glands perform. It is admitting as much as the peculiarities of the catamenial blood require, and as the anatomical structure of the organ from which it is disgorged, permits. It is admitting rather more than for my own part I am willing to admit, while I have before my mind's eye, the general plethoric state of the female constitution, immediately preceding this evacuation. In short, I must confess Cullen's opinion is not without some strong claims; and, if I do not yield absolute acquiescence in it, it is because my mind leans to a participatory union of some of the points of it, with some part of the idea of Hunter.

The liability of the uterus to glandular diseases as scirrhus and cancer, is no proof as Dr. Chapman infers it to be, that it is, or ought to be considered a gland: since the stomach, which is none, is liable to the same affections. The convolutions of its large and thin coated arteries, may more reasonably be accounted for by the destined necessity of distension of the whole organ in pregnancy, and of its parts of course, than by assiguing to this structure a glandular office; nature would provide by this structure of the blood vessels a facility for such distension. The rigidity and narrowness of the veins by which the blood "returns with difficulty," is also accounted for by the evident necessity of a considerable presence of blood in the viscus, to supply its demand during pregnancy; and since that state is not always present, in the same individual, and not at all in the

life of many, the exit of the influx is provided for, by the catamenial flow.

To sum up the peculiarities of catamenial blood, for blood I deem it, I would observe that it differs in colour, in odour, in its refusing to coagulate, (but gratuitously) in its destitution of fibrin—all which indicate the loss of its "vitality," as Mr. John Hunter would say.

EMOLLIENTS.

Mechanical remedies which soften and lubricate the skin, and thence extend their relaxing quality to the continuous and adjacent teguments, vascular and nervous structure. Their agency is, when of a watery kind, promoted by a heat above 62 of Farenheit, and under that exaltation which would cause the sensation of pain. The same observation applies to bland watery mixtures as milk and water, flaxseed tea, barley water, and similar articles. But it is doubtful whether additional heat be requisite to ensure or enhance the emollient effect of oils or oleaginous substances or mixtures. Emollients may be water of the raised temperatures mentioned, or in a state of vapour, or even in a state of reduced temperature applied by dropping or pouring it from a distance, by what the French term *douche*. The pumping of cold water on an inflamed and rigid or sprained joint has the same effect of softening the part, by the additional power of velocity, by which the parts are mechanically excited to a more healthy and equable action. Cullen's explanation of this mode of applying water as an emollient, appears to me incorrect; and the insufficiency of his theory of emollients generally, to explain the action of mild cataplasms and fomentations, is plain. His theory stated. Dr. Paris attributes the tendency of these "to the relaxing effects of heat and moisture on the extreme vessels of the surface, propagated by *contiguous sympathy* to the deeper seated organs."

Emollients may also be the preparations in which heat and moisture are so combined with a watery, or a watery and an oleaginous fluid, as to keep up the action each separately evinces when applied to the skin, for a considerable time. Such preparations are the common poultice of bread and milk which contains a portion of olive oil or similar substance—of flaxseed meal, of slippery elm bark, of chammomile flowers soaked in water, and similar preparations. It has been observed, that both heat and moisture applied to the skin, have an emollient effect of greater or less degree, according to the long duration or short continuance of time they are so applied. It is for this reason we observe a peculiar emollient result from poultices. In case of applying heat, by means of cloths rung out of boiling water, and fomentations of watery fluids of a less exalted temperature, but little benefit is derived from them, for the same reason, unless they be perseveringly applied long at one time. Cullen remarks, "we can hardly ever find the continuance of an hour less than sufficient." Emollients may also be the application of certain fat oils in an unctuous state, as common goose grease, bears grease, hogs lard, suet or the fat of sheep as prepared for candles. These are ready domestic applications, and are frequently applied by frictions, which add, as I have already observed in reference to the *douche*, an additional mechanical agent. Olive oil is one of the commonest emollient applications.

The operation of some of the preceding substances to excoriated surfaces, may be explained in the same manner. They also operate by their bland mucilaginous quality, in allaying the force of phlegmonous and erysipelatous affections. The curative and alleviative power of this class is far

from inconsiderable in numerous affections; but particularly those of chronic articular and muscular rheumatism, contusions, burns, and the like. And the emollient poultice is essential in the practice of surgery.

EPISPASTICS.

External applications which inflame the skin, and cause an effusion of serum under the cuticle. This serous deposition is contained in large vesicles, which consist of the cuticle raised above the true skin, and separated from it by the contained fluid. It is liberated either by the spontaneous rupture of these vesications, or by puncture. The discharge from the inflamed and denuded surface then becomes, in a short time after, puriform. The common blistering fly produces, thus externally applied to the cuticle, a train of effects which may be considered the type of the operation of these agents. Every one knows that these effects are what in common parle is termed a blister. The immediate action of cantharides applied to the cuticle, is evidently by their stimulant influence on the cutaneous blood vessels, exciting them to increased energy and thus producing cutaneous inflammation. Serous effusion by the exhalent extremities of these vessels, is a natural consequence of this. In so far, the effect of a blister is stimulating. The subsequent conversion of the serous discharge to a puriform one, is the next natural effort of the diseased surface, to resolve itself, and restore healthy action. The puriform discharge continues a short or a longer time, according in some measure to the condition of the individual system, but chiefly in consequence of the nature of the dressings applied. If they be of

a soothing and healing nature, twenty-four hours after the blister is first dressed, will usually bring about its cessation: and if of a nature approaching to that of the agent first used to vesicate, as fly-ointment or savin-ointment, the puriform discharge is established, and continues to be thrown off in sufficient quantity to reduce somewhat, the general tone of the system. In this case the blister becomes an artificial external drain on the body, and is termed a perpetual blister; and it now ceases to be a stimulant. In this state a blister is analogous in its effects, to setons and issues, which are the proper artificial drains, chiefly differing by their insertion into teguments and muscles, and by their draining from a more circumscribed extent. Here then are two opposite consequences of a blister—consequences generally within our control, and rendering the remedy of two-fold use. It fortunately happens, that where the drain of a perpetual or (to disuse the improper term for one more appropriate) a continued blister, is conceived useful or efficacious, the first stimulating impulse of the application can do no harm. And in cases where the first impulse alone is required, we possess the means of checking its commutation into the drain, by a course already pointed out. In this view of epispastics it must be clear to you, that they are important agents in medical and surgical practice. They have immemorially been much used, from ancient experience of their efficacy in numerous diseases and disorders of the visceral system, and for many local affections of the muscular and articular frame. In certain fevers of low type however, the wasted sensibility of the cutaneous system, renders it untangible by their power, great and certain as that power is, under common circumstances of morbid action. And it

happens that these fevers are often curable or fatal, according as we can excite the skin or may be frustrated in our efforts to do this. Flies being inadequate to rouse the system through the skin, as already stated, a very important augmentation of their vesicating quality was some years ago devised by my friend Dr. Hartshorne of this city; by which, intensity of stimulating action and what is equally desirable in the peculiar cases alluded to, a more sudden development of its effect, is secured to the practitioner. His improvement consists in boiling spanish flies in the oil of turpentine; and from much experience with the decoction, I am prepared to invite your attention to it as one of the most important, useful and desired improvements in pharmacy which has been made for a long time. The energy of its action meets the close danger of the case. Whatever value there may be attributed, and it is universally conceived to be great, to the rousing action of flies, that value is enhanced to our utmost wishes, by the intensity and celerity of action pertaining to the decoction of cantharides in turpentine.

The channel through which the sanative agency of blisters is imparted to the general system, in fevers and other diseases involving general disturbance of the frame: the manner in which their curative agency is exerted in the local pains of inflammatory diseases as peripneumony; and in removing swellings of the body over the regions of particular viscera which are among the sequelæ of protracted intermittents; and their beneficial operation on articular rigidity and watery depositions, arising from chronic rheumatism or injuries, —have all been fruitful sources of inquiry and discussion. Much diversity of opinion has been de-

veloped on these points; and yet we are not much enlightened by the investigation. All that seems to be clearly ascertained in relation to these remedies, is, fortunately, what chiefly concerns us; their practical uses.

Experience has furnished ample knowledge on this point; and we may, without any material interference with a just appreciation of their real efficacy in various affections, leave the unsettled points of modus operandi, to the ingenious-disputatious. But, that you may not be uninformed on the leading traits of these varied and vascillating opinions, I shall briefly enumerate the chief of them:—

Cullen, in conformity with the key-note of his theory of fever, believed they relaxed spasm of the cuticular vessels: thus helping the cure by removing the cause, and consecutively inducing their well known diaphoretic effect: and in spasmodic affections, performing the part of antispasmodics. Many of the older writers conceived that much of their beneficial operation was attributable to the serous evacuation they induce, while the skin is in a state of vesication. And as it has been sometimes observed that the establishment of puriform discharge gave the first indication of benefit, it has been surmised, that additional strength was added by that fact, to the idea of their depleting quality. By some it has been supposed that blisters operate in removing local pain, by creating a new action in an outward part: thus abstrating the force of morbid excitement concentrated within, and inviting it to a less injurious seat of action, leaving the internal diseased action by that much the weaker, and consequently in the way of a spedier return to equalized healthy action. This opinion embraces a wider range. It extends

to the belief that diseased excitement may be removed by causing a new and different excitement, though it may be even a morbid or at least an natural one, in the same part. And in this way, those who entertain it, would account for the good effects of blisters in assuaging erysipelatous inflammation: while others attribute this effect to their causing a direct evacuation of serum from the inflamed vessels morbidly excited in that species of disease. The efficacy of these remedies in removing pain from the side when applied to it, in pleurisy, has been attributed to an increased determination to the surface, and in so doing, deriving morbid excitement from the pleura. Anciently they were supposed to convey out of the system, by their serous and puriform discharge, that morbific matter, or acrimony, which, according to the prevailing doctrines of the day, were the causes of disease within the body. As blisters had been observed to produce strangury: and as the internal use of cantharides is often characterized by the same effect, it has been believed that their active principle is absorbed, taken into the course of the circulation. and by the change it effects in the blood, induces the healthful stimulation to the general system, which has been observed often to follow their application. Many more hypothetical solutions of the mode of acting on the diseased system, have been suggested to account for their curative, or alleviating effects. They have therefore been deemed stimulants acting by their rousing energy; evacuants, by their depleting power; counter-stimulants, or irritants, by exciting new action to smother the old; revulsives, by their determining morbid action to the surface: antispasmodics by their relaxing cutaneous spasm; cordials, in other words tonics, be-

cause they invigorate the nervous system in those miserable beings crushed by "a preponderance of mental or corporeal infirmity or weakness;"* mental exhilarating agents, because the celebrated Dunning, a barrister of the London bar was fool enough to put a blister on his breast when called "on great occasions to make the finest display of his powers, forensic and parlimentary, and found it to elevate his mind."†!!! Scavengers because they rake up and sweep out of the system acrimony or morbific stuff! Herculean combatant remedies, by sending their little acrimonious particles through the pores of the skin into the blood, to battle-the-watch with the acrimonious particles of morbific matters they may meet with there, and to drive them *vi-et armis* out!! or more pacific and seductive, but equally efficacious powers, which genteelly knock at the door (the skin) and 'invite,' 'solicit,' or 'draw' to it, the morbid destroyers within, and thus shew them the way to clear themselves!!! They have been all this—"every thing by starts but nothing long," and yet they are, in sooth, after all—mere blisters. The preceding sketch is a melancholly picture of the waste of intellect and study, without one light, one shadow of true *keeping* with the original design. Nothing resulting to fix the mind on a more varied or extended employment of these agents. That they are useful, and possess important qualities of a curative nature, experience has from an early date taught the practitioner. How they are so I cannot tell. I might indeed beguile you with some new hypothesis, as wise—likely to be current as long—as useful practically, —and predicated on facts as solitary and insulated as some if not all of the preceding. But what

* Dr. Chapman, Therapeutics, Epispastics.
† Dr. Chapman, *ibid.* *ibid.*

would it avail? What do those speculations avail? I can in my conscience only teach you that epispastics raise blisters, and blisters are serviceable, as experience has instructed, in certain diseases and affections which will be enumerated briefly here, and more in detail in the lectures. I will forego this duty a moment to offer you a quotation from the philosophic, erudite and tasteful Darwin, who refers the class to his *secernentia*.

"But a blister acts with more permanent and certain effect by stimulating a part of the skin, and thence affecting the whole of it, and of the stomach by association, and thence removes the most obstinate heartburns and vomitings. From this the principal use of blisters is understood, which is to invigorate the exertions of the arterial and lymphatic vessels of the skin, producing an increase of insensible perspiration, and of cutaneous absorption; and to increase the action of the stomach, and the consequent power of digestion; and *thence by sympathy to excite all the other irritative motions*: hence they relieve pains of the cold kind, which originate from defect of motion; not from their introducing a greater pain, as some have imagined, but by stimulating the torpid vessels into their usual action; and thence increasing the action and consequent warmth of the whole skin, and of all the parts which are associated with it."

If there is a theory of the operation of blisters on the diseased and healthy animal system to which I can subscribe, it is the foregoing. Like a jewelled watch, the pivot of its 'wheel within a wheel,' turns on that lustrous doctrine of healthy and morbid physiology--sympathy. It is a harmonious consent of associated actions, voluntary and involuntary in health: and sympathising acquiescence in disordered function, or associated action. Brown's and Cullen's theories, in Europe, and the "morbid ex-

citement" of Rush, in this country, caused it to slumber in the schools; but I am happy to say it has been revived, adopted and implicitly followed, in the prelections of a distinguished teacher of medicine in our sister school. That he is entitled to the credit of being a proselyte of Darwin and Hunter, is abundantly shewn in his therapeutic disquisitions, and in such of his practical lectures as I have had the pleasure to hear. On the subject of blisters, discoursing on their general action and their effect of occasioning strangury, he chimes with Darwin, as I have just observed. I am inclined to do, remarking, "May we not then account for it (the production of strangury) on the principle of extended action through the medium of sympathy? Cantharides are universally allowed to be one of the articles of materia medica, which most conspicuously display their affinity to the urinary organs. Applied in the form of a blister to the surface of the body, they excite a local impression, which by virtue of the consent of parts, is propagated in the mode I have just mentioned. This, at least, is the solution of the difficulty which accords best with my medical creed, and I think, too, with the existing state of our medical intelligence.*

THE MEDICAL USE OF BLISTERS.

They are beneficial in febrile diseases when applied at the 'blistering point' as Rush called it, in their course. This point pre-supposes the use of bleeding and evacuants which are particularly necessary in fevers of high action and local pain.

* Dr. Chapman, Therapeutics—Epispastics.

Blisters have been opposed in these fevers by many practitioners, among the most conspicuous is Fordyce. In intermittents they often display signal relief, and pave the way for bark, which, without their previous use, is unavailing. They remove local pain, shorten the disease, and resolve congestions of the spleen, liver, and other viscera. In continued fevers, their use is problematical ; and at all events great circumspection is required to interpose them between high action and approaching collapse. It has been observed by Percival, and my own extensive experience with fevers of a warm climate, sustains his position, that in fevers attended with a general disposition to inflammation, without partial or local affection greater in one part than another, blisters always act injuriously ; but that in cases of local inflammation with general febrile action, they are always useful. The efficacy of these remedies in pleurisy is universally known. In this acute disease, they should be defered, for the most part, until depletion has been used ; yet cases do occur in which they may be applied much earlier. There is indeed no reason why bleeding should not be practiced after their application and before the proper period arrives at which they are to be removed. Hydrothorax is said to follow blistering the chest before blood-letting ; a fact mentioned by Armstrong. Some have recommended the application of blisters in pneumonic disease to the extremeties, or between the shoulders, in preference to the chest. I have often used them in both ways, but give decided preference to the chest in inflammation of the pleura, and to the space between the shoulder blades, in congestive states of the lungs. In phthisis they may be often requisite, placed on the breast. In inflammatory affections of the trachea, and larynx, and of the

tonsils, they are important remedies. In croup they are not so serviceable as turpentine. I need not observe that they succeed general and topical blood-letting in the three first affections. But I have never seen any reason to refrain from the simultaneous rubefacient effect of turpentine with bleeding, in croup. Hepatitis in its acute or chronic state, is another disease in which these applications are beneficial. I have seen much benefit from them in the acute form after the use of the blue pill. In hydrocephalus they appear to me never to have any good effects, applied as they usually are to the scalp, in its last stages. It is a common practice; it is, to say the least of it an unnecessary one. If they ever do good in this affection which I am much inclined, from what I have seen, to doubt; it is when early applied, after the most copious blood-letting. My experience with this disease, has not encouraged me to place much dependence upon them, even in the acute stage. If it ever be an idiopathic inflammation of the brain, which causes effusion or at least the symptoms of it, as developed in hydrocephalus, it is one not likely to be reached, by any remedy but general and topical blood-letting. And on the other hand, when it is a symptomatic affection of bowel irritation or disorder accompanying dentition as it is nine times out of ten, blisters are more likely to do good to the surface covering the abdomen. This leads me to remark that they are in no affection more important, than in gastritis and enteritis, after energetic depletion of the sanguiferous system. In dysentery they have immemorially been applied either to the abdomen or extremities. They often sooth the painful distress of the bowels, when applied to the belly at the very time the patient endures the most

excruciating tormina. For this purpose the experience of the East is in favour of nitric acid, rather than flies. Their power of inducing sleep here, I have often observed conspicuous, after opium had failed to produce it. Occasionally it does happen that the extremities afford the best sites for their operation, and there I have often applied them beneficially. These have chiefly been chronic cases. It is not uncommon to find them recommended in cholera-morbus. Here I prefer to them, stimulating pungent aromatics. Applied to the wrists and ankles they check diarrhœa. In chronic rheumatism: and after the high action has been subdued in acute inflammatory cases, they are important remedies, as the experience of every practitioner can attest. But in gout I am not able to say as much. In my own practice they have done no good here; but very high authority is not wanting, in favour of their efficacy. It is however declared that in misplaced arthritic action, they are serviceable on the part affected. In phrenitis, they are important, applied to the head; in apoplexy to the spine and extremities, in delirium of low fevers, to the nape of the neck and often to the whole scalp. In the early stage of mania, and with circumspection, they do good, but when the disease is somewhat chronic they are unavailing though often perseveringly used to the head. In chronic insanity I have seen them much employed by Dr. Rush, while I was resident physician of the Pennsylvania Hospital; but I never could consider them in any other light than prejudicial. I have often been surprised to observe how manifestly hurtful they were, and how frequently nearly as bad, in cases of mania, often aggravating the symptoms, even after free bleeding always directed by Dr. Rush. In hyste-

rical and morose mania from contumacious temper, combined with uterine disorder, I have applied them to the sacrum, in the hospital, with benefit in some cases. In palsy and gutta serena they are applied to the forehead over the supra-orbital nerve; and in chronic cases of opthalmia applied and kept open behind the ears, they are universally acknowledged beneficial. In spasm, or convulsions, from irritation induced by difficult dentition, they are very important aids to the cure. They may be applied to the spine or the temples or behind the ears. In the latter situation they have the effect of re-establishing the spontaneous puriform evacuation on the cessation of which spasm or convulsion have appeared. In eruptive fevers they are often beneficial and needful. In small-pox when respiration is impeded by the swelling of the fauces, they should be placed on the neck. They are often useful and necessary in measles: Dr. Armstrong's caution noticed. Blisters repeated in succession to the parts near an inflamed organ, are more useful than a single one kept running. In some hæmorrhages, after venesection, they restrain the bleeding, as in epistaxis, applied to the nape of the neck and in hæmoptisis to the chest. In epilepsy and tetanus they are commonly used, and high authority is found to sustain the importance of using them in these affections; they have been applied to the neck, spine and head. Incontinence of urine is relieved by their operation on the sacrum; and applied to the same place they have been found to act in producing a return of suppressed catamenia and in cases of retension. Dr. Joseph Klapp particularly recommends them here. They have removed obstinate cutaneous affections. Dr. Physick proposed them to check the advance of inflammation along a vein, in-

flamed by bleeding or other cause. He likewise first extensively applied them to arrest mortification, though Rœmer had previously observed that they appear to possess the power of arresting that process. They are used to resolve buboes and other glandular tumors, as in the mammæ and testes. In affections of the ear, they give relief placed behind it. In dropsies though much used they appear of doubtful propriety, except in hydrothorax. To the throat in scarlatina they are applied with good effect. To conclude these outlines of their efficacy in medical practice it may be observed, that for numerous anomalous affections, attended with deep seated pains or external swellings, in systems but little constitutionally disordered, they are our only resorts after cupping and leaching; and followed by rubefacients or stimulating liniments, they seldom fail. There is no practitioner of a few years standing, who does not use them in numerous irregular affections, besides the diseases already specified, in his daily practice. It is true, they are often prescribed without benefit in such, but it is also true, that they rarely do any injury under direction of a thoughtful and skilful practitioner. My brother has used the turpentine decoction of flies, instead of blisters, in erysipelas affecting worn out constitutions, where general low action prevailed, which would render the application of a common blister troublesome and pernicious.

Caries of the bones and joints, or a disposition to it, is cured by repeated blistering. Blisters have been applied with this view, to disease of the hip joint, and to white swellings: under their application the enlargements subside, crepitus between the bones which is owing to the abraded cartilages, ceases to be felt under their operation; and under

a series of vesicating applications, the joint is restored to its freedom and anchylosis prevented. Numerous other surgical benefits are obtained from these remedies. which I need not here detail.

They are contra-indicated by idiosyncracies, which render them productive of great distress, by painful strangury, great constitutional irritation, heat of body, insatiable thirst, spasm and convulsions. In peculiarly sensitive temperaments, the strangury is excruciating, and terminates in bloody urine, particularly when the blisters are applied contiguous to the urinary organs; to parts recently shaved; and if kept on an undue time after the vesication is raised. They are also contra-indicated in cases of great debility, with tendency to mortification: as low stages of petechial fever, in which I have in the army recruit service, seen gangrene and other distressing occurrences happen, from their use under my own direction. In confluent small-pox, malignant measles, and other similar diseases, they have proved very troublesome to heal, and have even produced gangrene of the part.

To relieve strangury it has been proposed to unite camphor with the blister or annoint the part to which it is to be applied with camphorated oil. But there are many instances in which camphor itself has induced strangury. Uva-ursi simultaneously administered with the application of the blister, was strongly recommended by the late Dr. Barton, to obviate this distressing affection. It certainly is a practice which often prevents the evil, yet it must be remembered there are cases in which blisters may be proper, while the prophylactic is inadmissable Diluent drinks have been often prescribed with this view: such as milk

and water, barley-water, gum arabic water, mucilaginous fluids as decoction of mallows, infusions of slippery elm-bark, flaxseed tea, &c. or some diuretic ptisans: as water-melon seed tea, parsley root tea; tea of carrot-seeds, scabious and the like.

In cases which admit of delay, the head should be shaved six, eight or ten hours before the application of the vesicatory, and the chance of strangury may be further lessened, by removal of the blister after it has risen, washing the part with some bland fluid as milk and water or oleaginous ointment and reapplying it. This may in particular cases, be done even in an hour or two, when it has acted as a rubefacient, and in instances of excessive pain, it may be altogether removed at this time and an emollient poultice substituted. Twelve hours is the time usually allotted for the continuance of blisters on any part of the body except the head, on which they are allowed to remain double that time. I really think there are numerous cases in which all the beneficial effects of the vesicating stimulus may be obtained in six or eight hours, particularly on the sensitive cuticle of infants and young persons. To me it appears that when the former have continued a half an hour to complain by word or action, of the pain, a further continuance of it may be saved by a removal of the cause. Notwithstanding this however, it does sometimes happen, that both with children and adults, a time exceeding that already specified, as the usual period of their application must be allowed, to obtain all the benefit desired. To know when this is proper must be the result of observation of the case under immediate treatment.

ERRHINES, OR STERNUTATORIES.

Substances which snuffed up the nostrils, stimulate the pituitary membrane, establishing a discharge from it when suppressed, and increasing it when it exists.

By contiguous sympathy, the stimulating impulse thus given to the schneiderian membrane, is extended more or less vigorously to the vicinal parts. Cullen has gone so far as to assert that the effect of errhines extends not only to the vessels of the neighbouring muscles, by which rheumatic congestions are removed and odontalgic irritation allayed, but even supposes it may extend to the whole of the branches of the external carotid. To this he refers their known power, in some instances, of curing head-aches, pains of the ear and opthalmias. But further, he thinks it "probable that they may operate more or less on the whole vessels of the head, as even a branch of the internal carotid passes into the nose."

Errhines create for the most part, sneezing; but this is by no means a constant effect, even in such instances as are characterized by the renewed or increased mucous discharge. Many however believe, that to the convulsive catenated actions of sneezing, which involve the muscles of the face, throat, tongue, and respiration, is equally owing the salutary effect of these remedies, as to the increase in the mucous or sero-mucous defluxion.

The sero-mucous discharge and the sneezing are not the only immediate effects of errhines. When snuffed high up the nose, they stimulate, the excretory duct of the lachrymal sack, and not only cause a defluxion from it, but by continuous sympathy propagated to the gland itself from the duct thus excited, an increased secretion of tears is the result. And this accounts for their abundant discharge in many cases of sneezing artificially excited; and to this effect is also doubtless to be attributed, the benefit resulting to the affections of the eyes, from the application of sternutatories. The resemblance of errhines to sialagogues noticed.

OF THE MEDICAL USE OF ERRHINES.

The employment of these remedies, is now nearly obsolete. Formerly they were much used in various affections, among which may be particularly mentioned some varieties of gutta serena, as that described by Sauvages under the name of amaurosis plethorica, affecting sometimes, females labouring under retained or suppressed catamenia or pregnancy. Instances stated of the cure of gutta serena by these remedies, and the authorities on which they are related. They can be of no service when the paralysis of the optic nerve is owing to organic derangement or disease, as tumors pressing upon it, &c. Transitory amaurosis sometimes exists in combination with head-aches arising from deranged digestive function—it is said to have been cured by errhines. Deafness arising from a peculiar affection of the eustachian tube, has been relieved by errhines. They have been said to

cure or greatly relieve hemicrania: and have been said to prevent apoplexy and palsy. The danger of suppressing an artificial drain from the nose by habitual use of snuff in apoplectic habits discussed. Illustrations given. Boyles report of absorption of cataract by euphorbium, a powerful errhine, stated. The efficacy of these remedies in opthalmia, stated. Sneezing as a critical occurrence in fevers and hydrocephalus, noticed; said to be favourable. This effect occurred in ten thousand men of Xenophon's army on the Euxine sea, on their recovery from the deleterious effects of poisonous honey. Mercurial errhines as turpeth mineral, used in polypus. Sneezing occasionally dangerous, producing local turgescence of the blood-vessels, particularly of the head, and sometimes of the chest. Their danger is supposed to have given rise to the *benediction* on sneezing, peculiar to the inhabitants of some countries. Necessary to advert to the fact of their occasional injurious tendency, in prescribing them for whatever purpose. Medicated snuffs noticed; their cephalic efficacy depends on a mercurial errhine generally, and often on the union with common tobacco, of powerful sternutatories as euphorbium, asarabacca, arum or cuckow-pint. The latter used by Loesecke in gutta serena with efficacy. The medicines just mentioned, with the vapour of spirit of sal-ammoniac, white hellebore, marjoram, lavender, orris-root, horse-chesnut, hedera terrestris and betony, are the chief subjects of this class. We have several indigenous plants which possess the same errhine property, as helenium, autumnale or sneeze-weed, sanguinaria canadensis, &c. Warm water snuffed up the nose acts as an errhine. The juice of common beet applied in the same way is slightly errhine. The snuffing of

the vapour of ether, with laudanum, has also been much used. It acts by stimulating the schneiderian membrane as the preceding articles do. In some instances of annual periodical catarrh attended with obstinate suppression of the nasal secretion, I have known it beneficial. It is a favourite prescription in such cases with Dr. Physick. The cases related.

"Mr. Reddelin of Weimer, has recently communicated to the Royal Society of Gottingen through Professor Blumenbach the following successful treatment of croup after the usual remedies had been tried without effect. The patient a female aged 19, who on the third day after being seized with croup was unable to swallow, had began to rattle in the throat and seemed to be rapidly approaching her dissolution. Dr. R. insinuated by means of a quill a mixture of Spanish snuff and morocco* into her nostrils, and after repeating this mixture a second time it excited sneezing and vomiting. They occasioned the discharge of two long membranous cylinders from the trachea, upon which the rattling immediately ceased and the patient was rescued from suffocation."†

To conclude: the defluxion produced by errhines is commonly evanescent; yet it does continue often for several hours, and occasionally the established secretion continues in augmented quantity for several days. It is obvious, from the preceding remarks, that the power of errhines is local, though it was maintained by the late Dr. Barton, that errhines taken into the stomach did occasionally produce the same effect.

* The root of *adonis autumnalis.*

† Med. Chir. Review, Vol. 1.

in a few hours, as when topically used: an opinion in which I see no good reason to acquiesce. The facts on which he founded his belief on this point stated. The medical application of these remedies, is circumscribed to a few affections, and those of a local or insulated character. Still cases may, and indeed I know they do occur, for I have met with them, in which errhines may advantageously be used with palliative if not curative effect. They are however, as I have remarked in the outset, nearly obsolete. In other words they are out of fashion, as indeed are many more important remedies, which have been pushed away from sight and use, by that rage for panaceas, that mania for quacks—engendered, fomented, and unhappily for science and the dignity and usefulness of the profession sustained—by the mania of some of its own distinguished members!!!

ESCAROTICS.

Substances and agents which erode, destroy, or decompose, the solid fibre of the living body: applied to the skin they erode it, and to ulcers or denuded muscles, or teguements, they remove the surface. They act:

1. By their natural properties as the heated iron and moxa in which case they are called actual cauteries: or,

2. By their chemical causticity, as the concentrated mineral acids, fused potash, the salts of metals formed with acids, as nitrate of silver, the muriate of antimony, (or butter of antimony,) the nitric oxide of quick-silver (or red precipitate,) the oxy-muriate of the same, (or corrosive sublimate,) the ammoniated sub-muriate of the same, (or white precipitate.) The sulphate of copper (or blue vitriol:) the subacetate of copper (or ærugo:) the arsenious acid, (or white oxyde of arsenic;) the dried sulphate of alumine,—all of which have been called the potential cauteries or caustics: or,

3. By the eroding causticity of their essential oil, as savin or the concentrated essential oil of cloves. The whole assemblage have been called caustics, cauteries, erodents and escharotics. They have by some been divided into *eroding escharotics* and *caustic escharotics*, a division grounded on the less or greater intensity of their destructive power.

The application of these substances is always attended with some pain, occasionally of an exas-

perated nature. It is however of short duration, leaving a sympathising inflammatory action in the contiguous and adjacent parts, which is greater or less in proportion to the liberal or sparing application of the caustic. and often some irritation of the whole system. Though the mineral acids are excellent escharotics. they are seldom used, on account of their fluidity, which renders it difficult to restrain their eroding action within the bounds desired. The dry grains of red precipitate answer the purpose very well, but the power of that substance is lessened by its union with an unctuous body, as is common. The lunar caustic is sufficiently manageable, and more frequently employed than the common caustic, or fused potash, which is more destructive. The butter of antimony. which is the most intense caustic known. is liable to the same objection as the fluid escharotics. not being in a solid form. The burned alum is weakest of all the escharotics. and may be suited to cases not requiring a great eroding power. The moxa is of ancient date. and its use has been revived of late years by many French surgeons—To Baron Larey chiefly, is to be attributed this restored surgical remedy.

The purposes to which escharotics are applied, are for the most part surgical. They are employed to remove excressencies, establish healthy action in ulcers, remove fungous granulations and thereby convert an ulcerated surface into a simple sore. Also for establishing issues in various parts of the body; for exciting the fractured ends of bones which are indisposed to form callous. and thereby promote union: and finally. by timid practitioners (at least in most instances) to open buboes and abscesses.

Dr. Paris remarks "the operation of these bodies may, in general, be considered chemical; for having destroyed the life of the part to which they are applied, they cause, as if by a species of resulting affinity, the elements of the animal matter to enter into a new state of combination; this is well exemplified in the action of caustic potass, where the nascent elements thus disengaged by the decomposition of the animal substances, reunite in proportions to generate an oily matter, which may be observed to form a film over the ulcerated surface, while the excess of nitrogen and hydrogen constitute the ammonia, which is disengaged during the action of the caustic; and may be rendered sensible by inverting over the surface a small jar moistened with muriatic acid, when fumes of *muriate of ammonia*, become visible."

A solution of lunar caustic has lately been recommended to be applied to the lining membrane of the upper part of the trachea in croup, to separate the inflammatory membranous product which is thrown out by the vessels in exasperated cases of that fell disease. And also to be applied to the eruptions of small pox to prevent deforming cicatrization:

EXPECTORANTS.

A mongrel and ill-defined class of remedies, the effect of which every one perceives, but no one can satisfactorily account for. I believe the only true expectorants are emetics. Stimulating diaphoretics often promote expectoration; but their more certain and constant effect is on the skin, hence they are properly located already. Many antispasmodics, as assafœtida, ammoniacum, musk, &c. facilitate expectoration. Yet they have a more decided and constant character. Should we, for this adventitious and by no means constant effect, refer them to the present class? Some narcotics, camphor for example, are expectorants; but this property in the example given (and others,) is subsidiary to a paramount operation on the brain and nervous system, which has caused it properly to be placed with the deleterious class, and not with the present. All the natural family of alliaceæ, facilitate expectoration, as onions and garlic for example. They are, in common with the tribe of bulbous rooted plants, as the squill, diuretic, —more decidedly so, in many instances, than they are expectorant. Shall we retain a class to receive them for an effect not always produced, while they have stronger claims to the position, already allotted to them? The whole tribe of terebinthinate, and fragrant balsams, as copaiva, tolu, peru, elemi, &c. facilitate expectoration they are general stimulants, diuretics and diaphoretics,

more constantly than expectorants. Blood-letting facilitates expectoration. A blister will do the same. The diffusible general stimulant, carbonate of ammonia, acts in this way; so do many of the acrid stimulants, as mezereon, indian turnip, senega snake root. Yet they have other effects more conspicuous, more steadily developed. Mucilages and oleaginous decoctions are placed with expectorants. They reach the kidnies and skin quite as surely as the bronchia and cells of the lungs. In short, not to give more examples of the inosculating effects of the subjects of this hybrid class, I would observe, that it is one of very obscure and unstead-fast character, embracing medicines which often fail in producing the effect of promoting and facilitating expectoration; often do this, when effected, by a secondary or even more remote effect, the primary one being that of a general stimulant involving the lungs and its appendages as a *part* of the *whole* thus incited to increased action.

These observations bear on the name, and on the definitions of the class, usually given by authors. They will tend to shew what I have been inculcating in these lectures, that classification is, beyond a few aggregations, useless, ineffective of the object for which it is designed, and misleading to the student and young practitioner. As I am not however opposed to the employment of the articles arranged by writers under this class, but on the contrary know them to be useful in practice, though still very second-rate remedies, I shall sketch the outlines of what is thought of their mode of operating, and their efficacy; guarding you against receiving them as agents of any *specific* tendency to affect the lungs and bronchia. There are no remedies of such effect. Whatever effect they evince upon the respiratory organs and func-

tions, I believe to be by the two fold operation 1. through the general circulation, by which they incite other organs and tissues besides the lungs, bronchia and mucous lining in an equal if not greater degree, and, 2. by the catenated chain of sympathetic actions.

Cullen defines expectorants thus: "These are medicines which facilitate the bringing up the contents of the cavity of the lungs. This however must always be done by more or less of coughing; but as we do not know, or at least I do not know, of any internal medicines for exciting this, I have confined my definition of expectorants to be those which render the contents of the bronchia to be more easily brought up." He seems to have thought that there are medicines which can expede the secretion of mucus in the bronchia, though they have not come to our knowledge. Since he has assumed as postulates, that expectoration cannot be performed but by coughing, and that we have no medicines known to induce this effect when internally administered, and also that we are not able by internal medicaments to augment the quantity or change the quality of the natural, or morbid contents of the bronchia, how does he account for the operation of expectorants? Discarding the assertion of Senac, that mucus exists in the mass of blood, he infers, and every rational view of the subject will, I think, justify any one in according with him, that the class of medicines, termed by some, attenuants, cannot operate in diluting a morbid viscosity of that mucus in the circulating blood and fluids, which has never been proved to exist in them. Reasoning in the same manner with reference to expectorants, he did not believe that any of them could operate in lessening the viscosity of the mucus, poured out of the mu-

cous follicles of the bronchia and cells of the lungs, by being taken into the circulation. And since these remedies can have, for these reasons, no power to attenuate the viscidity of the mucus, through the rout of sanguineous circulation, they could still less act in this way, in increasing the quantity of that mucus, it not being there present to act upon, and the tissues which secrete it being too remote to be supposed susceptible of being reached in this manner. Since the diseases in which expectorants, by common consent of opinion and practice, are required, are those marked by a deficiency of the mucus naturally exuding from the lining tissue of the lungs and bronchia, or a morbid increase in its due quantity and often with a conjunctive augmentation of adhering tenacity to the secreting surface with increase in its viscidity—it is plain he could attach no curative effect to the operation of expectorants. He does not doubt that the articles under this name, may diminish the determination of excited action to the lungs and its appendages, and thereby lessen the morbid accumulation of their secretion which may have been produced by that action, or rather prevent further accresion to the viscid increased mass already clogging their cells and passages. But he believed they effected this, by determining to the surface of the body that local excitement which caused the mischief. That they might readily do this cannot be doubted by any one who has observed or reflected on the sympathetic actions of the respiratory organs and the skin. He therefore believed they acted, not as expectorants, in the usual acceptation of that term, but as diaphoretics. He also supposed an explanation of their effects, and the only probable one he could offer, was "that by increasing the secretion of the liquid that is to

afford a mucus, this, as poured from the arteries into the follicles, being always a thin fluid, it may dilute the fluid in the follicles, and may make it to be poured out from these in a less viscid state, and may therefore be rendered more easy to be brought up by coughing, that is, to be more freely expectorated"—yet he does not ascribe any part of the coughing to the agency of the remedy, but deems it solely the natural effort of the lungs to disgorge their oppressive fluid. We are thus brought to his theory of the operation of expectorants. And it is evidently a theory at direct variance with many of the definitions of the class by authors, and with the meaning assigned to it in the common parle of the profession. It is indeed, rather than a theory to account for what he believes, one to render some attempt at a probable explanation of the belief of others. For his own part he circumscribes the operation of these remedies within a very narrow, but in my opinion a very proper sphere of action—simply, that "they facilitate the bringing up the contents of the cavity of the lungs." After this concession to his opinion, you need not be told, I do not believe in the specific agency of expectorants, or that I do believe the chief of them act beneficially by a course widely remote from primary action on the lungs; by a course passing over numerous chords of sympathetic catenation, the vibrations of which, thus excited, are first and most sensibly perceived in other parts of the body than the lungs, which however they reach before their oscillations have ceased. Dr. Paris, notwithstanding he does not believe in the specific agency of expectorants, has attached too much importance to the class, by an analysis of the various modes by which ultimately they act upon the lungs: an analysis which

proves how little they are entitled to be considered as any thing more than general stimulants—narcotic stimulants—antispasmodic stimulants—emetic stimulants—cathartic stimulants—in a word, any other kind of stimulants than such as are endued with a peculiar and direct operation on the lungs and their appendages. Dr. Paris could not have laboured more successfully to eradicate from our lists of medicines, the ill devised class under notice, than by this analysis of these varied modes of operating, and the exposition he has given of these devious routs, in his classification. It bears with so much confirmatory argument on my own views, that it is subjoined to aid me in establishing the object of the foregoing observations.

A CLASSIFICATION OF EXPECTORANTS

ACCORDING TO THEIR SUPPOSED MODES OF OPERATION.

CL: I—MEDICINES WHICH INCREASE PULMONARY EXHALATION, AND THEREBY DILUTE THE MUCUS IN THE FOLLICLES OF THE LUNGS.

a. By removing constriction of the Pulmonary Exhalent vessels.

Nauseants.

b. By stimulating these vessels by the *actual contact* of a medicinal substance.

Allium. *Fœtid Gums.*
Scilla?
The different Balsams.

CL: II.—MEDICINES WHICH DIMINISH THE INORDINATE FLOW OF FLUID INTO THE LUNGS, AND RENDER THE EXPECTORATION OF THE REMAINDER MORE EASY.

a. By removing the debility of the Exhalents.

Sulphate of Zinc. *Bitter Tonics.*

b. By increasing the power of the Absorbents.

Digitalis. *Nicotiana.*

c. By determining to the skin by gentle diaphoresis.

Tartarized Antimony.

d. By exciting serous discharges from the bowels.

Saline Purgatives.

CL. III.—MEDICINES WHICH OPERATE MECHANICALLY IN PROMOTING THE REJECTION OF ACCUMULATED MUCUS.

a. By stimulating the muscles of respiration.

Ammonia.

b. By exciting Vomiting, and thereby compressing the thoracic viscera.

Emetics.

In reference to the first of the classes just enumerated, which embraces medicines that increase pulmonary exhalation, by removing constriction from the exhalent vessels of the lungs, he assumes, that in *pneumonia*, asthma, and other diseases of the pulmonary system, the spasmodic constriction of the exhalents of the lungs, retards the exudation of the usual and necessary quantity of lubricating fluid poured out by them in a state of health. This is all true; at least the effect is certain, however he may account for it. But how does he propose to relieve the pulmonary system, of this perverted course of its healthy actions? Is it by remedies of local impulse, which, by that impulse liberate the embargoed gregations of mucous clots, and set them adrift in the passages of the lungs, there to excite coughing which causes their expulsion? No. Is it by attenuating the viscidity of these same clots, within the mucous follicles, by the same kind of local action, thus bringing them to such a state of fluidity as will enable them to pass the patulous and constricted mouths of these follicles into the pulmonary passages, that they may gain egress as above? No. Is it not by suggesting for relief, the exhibition of certain general stimulants operating on the general system first, and afterwards on the lungs as a part, by the relaxation of indirect debility—which decidedly convey by the first impression, an im-

pulsive excitement to many other parts of the system, besides the pulmonary organs, and generally indeed, in a much greater degree? Is it not by nauseants? What are they? The most stimulating emetics in small and divided doses. Why then call them expectorants, seeing expectoration when induced by them at all, is only one of a series of effects—one link of a catenated chain of associated irritative actions?

In regard to his second section of the same class, which comprises medicines suited to stimulate the pulmonary exhalents by the actual contact of their medicinal principle. I cannot but say there is much gratuitous foundation. The instance of garlic given by him, of a substance taken into the circulation, and evincing a peculiar determination to the lungs, is an unlucky one. It is true that the volatile and penetrating odour of this root is perceptible in the breath, and that this is also perceived as sensibly if it have been externally applied to the soles of the feet, as when internally taken. This proves the subtle and diffusible nature of its odoriferous principle whatever that may be: and further proves the readiness with which the circulating fluids of the body convey through their devious course, and by their mysterious operation —volatile odours; but to my satisfaction it does not prove, that the medicinal property has a peculiar predilection for the lungs. If the alliaceous odour of the breath evidences this predilection, as it is assumed, it does—if that be the criterion of its expectorant effect (to use common parle) why does not this effect supervene to the application of garlic to the soles of the feet? It is a disagreeable medicine to most persons, intolerable to many, and in some idiosyncracies, a dangerous one, inducing convulsions and cerebral hebetude. Why do we not in

such cases, nay, in all cases, of catarrhal engorgement without fever, or with little fever, cause expectoration by applying it to the soles of the feet? Will it operate on the lungs as an expectorant thus used? I answer from knowledge of the fact, that it will not. Who ever said it would? Yet it unquestionably ought to do so, if its peculiar effect on the lungs, (I do not deny that it has a strong ulterior effect on them) was owing to a peculiar determination to these organs, evinced by the odour of the breath—which is not only Dr. Paris' position, but one every-day avered by medical men. This is not the only instance of gratuitous reasoning in Dr. Paris' observations on this section. He says, "Such substances (as the alliaceæ) *may* stimulate the exhalent vessels through which they pass, and by this stimulus the secretion *may* be increased, and the mucus contained in the follicles diluted, so as to be poured out in a less viscid form, and consequently in a state to be more easily brought up by expectoration." And suppose I say this *may* all *not be so*—are there not as many facts to intrench this averment, as physiology furnishes to sustain his gratuitous position. It is after all, begging the question, and no fair deductions can be made from reasoning so faulty. What are the medicines besides garlic, which he proposes as expectorants in this section? Squill, the balsams, the fœtid gums. The first an active emetic, a more certain diuretic than most of its congeners in the class of diuretics; the second embracing an extensive tribe of natural vegetable secretions, all powerfully stimulant to the general system; the third active antispasmodics, involving the lungs as a part of that integrity of living matter over which they exercise a tranquilizing control, by the peculiarity of their inciting action on

the sympathetic harmonies of the body. Should these then be dubed by the sword and word of a classifying monarch, as he was who first devised the class—mere knights of a local domain, while they inherit incontestable claim to an extended sovereignty over the whole range of living animal space!

Let us pass on to the second class of Dr. Paris' scheme: Section *a*, embraces medicines which diminish the inordinate flow of fluid into the lungs, by removing what I deem is most incorrectly conceived the cause of this undue flow,—the debility of the exhalents. Debility, if it be one cause, is clearly not the only, nor the most frequent cause of this excessive secretion of mucus. Who that has seen the sudden accession of tracheal inflammation in adults, supervening to exposure to damp and coldness with very wet feet, in our spring or autumn: in which the patient is first apprised of his being sick by starting from his sleep with a sudden ejection of a deal of viscid mucus from his throat to prevent immediate suffocation, will refer this to a debility of the exhalents? If any one do assign such a cause, let him look to the treatment for the conviction of his error: copious bloodletting, emetics pushed so as to prostrate the system, open the skin, relax the entire bodily vigour; saline cathartics which establish, after a few hours the reduction of inflammation by these debilitating agents, by draining from the bowels and the kidnies. If debility be not the cause of augmented mucous secretion in this instance, it does no more clearly appear to me to be so, in what is called humoral asthma, and the catarrh of old people. There is indeed not a balanced action between the excreting and secreting power of the lungs and trachea in these affections. The former

remaining in usual activity, the latter in augmented force. To this increased action in the secretory vessels of the mucous tissue I would refer the effect of an increased flow of the mucus: and not to any debility in these exhalents as they are called. The effort of nature, (the contemned, but the rational belief in the *vis medicatrix naturæ*, leads me to use this language,) evinces a necessity to rid the surcharged passages, of this secretion, in the *tussis senilis*, or the cough of old people. Dr. Paris observes "if this excess be restrained by strengthening the tone of the system generally, or by astringing these vessels in particular, the expectoration of the remainder will be rendered much more easy." The effect here implied is the true one supervening to tonics or astringents: but I apprehend the cause cannot be, by any local action they exert in rousing the debilitated secreting tissues, for that debility does not, in my opinion exist—but by equalizing the excitement of the general system, thus invigorated by tonics and astringents: and consequently removing the undue local excitement prevailing in the mucous tissue. This inference is more conformable with the known operation of tonics and astringents. By this reasoning I am brought to conclude, as already advanced, that the increased flow of mucus in the catarrh of old people, in humoral asthma, and similar affections afflicting persons debilitated from age or disease, is owing to an increased energy in the secreting vessels, and not to debility. And that the inconvenience arising from this excessive engorgement depends on an inadequacy in the excreting energies of the parts involved, to meet the super-abundant flow. No more happens here than to the kidnies and urinary organs, in persons as they advance in age. The increased

secretion of urine, owing to a deficient action in advanced life, of the discharging function of the skin, causes perpetual micturition. We cannot allow that the increased urine is produced by a debility of the secreting powers of the kidnies, but by its increased action from the cause already mentioned. The inadequacy of the urinary organs to retain this as long as in earlier life when more general vigour pervaded the system, may indeed be owing to a debility of their excreting function; and in like manner, as with the lungs, tonics and astringents would here bring about a balanced action between secretion and excretion. The sulphate of zinc, indicated by Dr. Paris, as particularly efficacious in restoring the "debility of the exhalents," is a tonic and a certain one under proper management. What has been said therefore above, of tonics and astringents generally, is equally applicable to this medicine.

Section *b* of the second class refers to medicines which have the power of increasing the action of the absorbents, under the belief that the "mucous inundation may not depend upon any fault in the exhalents, but upon a torpid state of the pulmonary absorbents." These are digitalis and tobacco? two narcotics of somewhat diverse power of acting on the system. Here I am happy to agree with Dr. Paris as to the cause of the evil: but with what propriety can the remedies he designates for it, be denominated expectorants?

Section *c* of the same class comprises medicines which determine to the skin by gentle diaphoresis; and their action in relieving the lungs by restoring that checked cutaneous discharge, on the paucity of total suppression of which, the lungs are engorged by performing, in common with the kidnies, the serous exhalations which should have

been conveyed out of the body by the torpid or inactive emunctories of the surface. The whole of Dr. Paris' reasoning on this point, is unanswerably true, and the "well regulated doses of the compound powder of ipecacuan," which he says, "frequently furnish the oppressed asthmatic with a valuable resource," I know from experience do have that remediate effect. But for this reason is this compound medicine, or are the ingredients of which it is composed, to be called expectorants? Is not this action, manifestly, by restoring the sympathetic concert of function, now dissociated, between the skin, the lungs and the kidnies, to their healthy routine of action? Do they not do this, palpably, by opening the arid skin? And what are medicines which do this but diaphoretics. Diaphoresis is the primary and evident effect of the medicine specified and its like: liberation of congestive serous or mucous engorgement of the lungs and its appendages, the ulterior consecutive effect.

Section *d* of the same class is predicated on the same principle as the preceding section, embracing such medicines as excite serous discharges from the bowels, as saline cathartics. They relieve the lungs on the same principle, and avowedly, are not expectorants by any other effect than one involved in the general return they produce, of regular, healthy and equalized action in the general system. Why then call them so?

We are thus led to class third comprising medicines which operate mechanically, and the first section *a*, points to those which impart vigour to the respiratory muscles engaged in the act of expectoration. It is grounded on a fact universally admitted, that the act of expectoration is chiefly voluntary. We all know this, and an effort to

cough or screatus, when excited by the stimulus of mucus so to do: or an effort to restrain either action under pressure of the same stimulus, will prove it instantly. It is supposed that when the voluntary effort is made and is found impracticable to any efficient extent, the difficulty is owing to a state of extreme debility of the muscles necessary to the act—and to patients exhausted by tuberculous cough or ulcerated vomicas, which tire by perpetual efforts to expectorate, great distress is often produced by this inability to rid the lungs of the still oppressive load. It is in such cases a stimulant like ammonia is supposed by Dr. Paris, to act mechanically, in promoting a rejection of the accumulated mucus. I refer the effect here to an evanescent tone communicated to the general system by the diffusible stimulant, and not to any mechanical action on the respiratory muscles. The latter mode of accounting for an evident fact, is, I think, quite unphilosophical. The word mechanical, if in any other than a figurative way used, is inappropriate and calculated to mislead. Shall the powerful, diffusible, volatile stimulant, marked by the intensity of its action, and its known power to pervade in a few moments the whole system—be called an expectorant, simply because increased, though transitory tone, is communicated to the muscles concerned in expectoration, (now worn down with effort and fatigue,) in the sweep of its general stimulating sway? Here then, is no expectorant, but by an impulse common to the parts of the whole, by which excitability is renewed.

Section *b* of this class leads us to the starting point of this canvass of Dr. Paris' classification—emetics. They are, truly, expectorants; they cause coughing and screatus, by which the present contained fluids of the lungs and trachea are violently ejected or expectorated. The concussion of

the thoracic viscera during their operation, causes an increased excitement of all the processes of secretion and excretion, pertaining to them, which does not cease with the cessation of their operation. A healthy equipoise of action is kept up for days, weeks, nay often months; and in their effects may be recognised a union of mechanical, with physiological action.

As a corollary to the preceding observations, I state, that with the exception of the class of emetics, and some inhalations I know of no such remedies as expectorants. Neither can I conceive of any propriety in retaining such a class, when it has been shewn how little legitimate claim it possesses to the tenure it has heretofore held in all treatises on materia medica. While this opinion is ventured, however, it is proper that it should be stated, that it is on the ground not only of the absolute variance between the mode of action of the medicines arrayed in the class, and the course they should take in producing their effects, were they in any especial manner directed to the lungs so as to perform what their name requires they should do; but also, because the designating these remedies by a name which characterizes only one of their several effects on the system, is calculated to mislead the student and young practitioner. There is no difficulty in disposing of the remedies in question, if classification must be had, in places more fit for their reception, according to their primary action; while their secondary influence on the lungs need not be lost sight of on this account. Opposed as I am to treat of the materia medica by any of the common schemes of classification, these latter remarks are intended to meet the objections of those, in reference to the individual class under notice, who persist in the propriety and usefulness

of these systematic arrangements. To conclude, the whole view of the subject, in the light here presented, is calculated, I should think, to afford another additional, and by no means inconsequent argument, in favour of alphabetical disposition of medical agents, by which every article may be noticed for all its effects, at one discussion of its merits, under its appropriate letter.

The medical use of expectorants is chiefly restricted to catarrh, pneumonic disease and asthma; whatever other use they may be supposed capable of serving, must have appeared fully developed in the course of the preceding canvass of the theoretical views of authors on the subject of their mode of operating on the lungs. In the exhibition of these, for any of the diseases to which they are supposed remediate, an observance of such directions to the patient or his attendants is to be inforced, as may promote the diaphoresis, the reduction of spasm, the narcotic influence on the nervous, or the stimulant excitement of the lymphatic systems, or whatever other primary effect, by the consecutive operation of which, the lungs are reached. Every proceeding which may retard or interfere in any manner with these, will be found, if not positively prejudicial, at least calculated to render the medicines ineffectual of the indication, or productive of a loss of time and unnecessary subjection of the patient to useless medicines.

ENEMATA.

These are watery fluids, oily, or mucilaginous substances, thrown by mechanical force into the bowels, through the anus. Their chief operation

is on the rectum, and they rarely can be made to pass the sigmoid flexure of the colon. They may be divided into

CLASS 1. Aqueous clysters.
2. Oily clysters.
3. Mucilaginous clysters.
4. Mixed clysters.
5. Medicated clysters.
6. Aeriform clysters.

The first may be either tepid, cold, or iced water; operating chiefly by the stimulus of mechanical distension and temperature.

The second may be melted butter, washed lard, or goose-grease—alone or commingled with tepid water.

The third may be flax-seed tea, starch, arrow-root, barley-water, decoction of mallows, slippery elm-bark, okra, and similar lubricating mucilages.

The fourth may be molasses and water, with olive oil or grease—weak mutton broth, soap-suds, or a mixture of any of class third with class second.

The fifth are class 3d, with the mucilages dense, or diluted, with the addition of laudanum, aloes, assafœtida, infusion of colocynth, castor oil; or senna tea, oil of turpentine suspended in yolk of egg and mucilage of gum-arabic, infusion of tobacco, solutions of saline cathartics, rhubarb tea, and indeed any other liquid preparation of a cathartic, lime-water, &c. &c.

Sixth, fumes of tobacco, and other narcotic herbs.

For administering the first five classes, common clyster or injecting pipes, of different sizes according to the age of the patient, or bladders with an injecting pipe tied to the mouth, or caoutchouc

bottles, are used according to convenience. For the last class a particular apparatus has been devised. The distress, prostration and near danger and death which have resulted from the clyster of tobacco in the form of class 5th or 6th, have caused Mr. Earle to propose as a substitute for either, when the peculiar effect of tobacco is wanted, suppositories of that plant which can be removed on accession of any undesired effect.

Enemata act by distension, by the physical effect of their temperature, or specific stimulus of their medicating ingredient on the bowels; or by all combined, together with an impulsive stroke on the chain of sympathies involved in alvine secretions and dejections. When highly medicated with medicinal irritants, they have been accused of inducing spasmodic constriction, instead of evacuant action, thus bolting the door already shut. I have known them to do this under my own eye. In such cases I have attributed the mischief to undue proportion of the prescribed drug, by carelessness, inattention to the directions of the physician, or ignorance of the nurse or friends. This induces me to observe, that a prescription should always be written for a medicated clyster, unless in the simple one of laudanum, prescribed among intelligent and cautious people. Or, the medical attendant should mix it himself and direct its exhibition. Simple aqueous clysters have been efficacious in removing a spasmodic state of the bowels, so as to overcome ileus. The mixed clysters are those most used in medical and domestic practice. In the former they are used to hasten the slow operation of cathartics, or to evacuate the bowels when the irritable state of the stomach causes it to reject medicines. In the later they are chiefly used as substitutes for cathartics. The

anodyne clysters are much used by physicians, but the truly medicated injections are not as often employed in this as in other countries, particularly France. The free operation of a clyster is attended with most of the general effects following laxative medicines. The impulsive energy given by purgatives to the whole system however, can never be obtained by even active medicated clysters, as of aloes, castor oil, colocynth. But for this very reason they do not produce the immediate prostration often induced by purgatives, and hence they may be frequently repeated within a few hours or during a day. Every practitioner will acknowledge the importance of these remedies, either as absolute or adventitious curative agents—and every practitioner will also confess, that it is much easier to know the precise condition of a particular patient's system and disease which may render them appropriate with either view, than to point out any general rules in the abstract, which may suggest their propriety and efficacy in the treatment of diseases. For this reason I shall not here enter into a discussion of this point, but, in the lectures shall endeavour by familiar illustration and remarks to say as much as I am able, to lead you to devote as much attention to this class of remedies, as its importance demands. With these remarks I dismiss the subject, refering you for the formulæ of proportions and measurement graduated to ages, to the lectures.

INHALATIONS.

These are the vapours of heated, simple, or medicated fluids—of certain aetherial medicines—of fragrant and stimulating balsams, gums and resins—the vapour of fused nitre—and the fumes of narcotic drugs. The emollient and medicinal principles of some of these, and the volatile stimulus of others, are conveyed to an immediate contact with the bronchia and cells of the lungs, by the voluntary augmentation of the force of the respiratory efforts, through the deep inspirations of which the subtle vapourable principle is drawn into every part of the cellular structure of the lungs; or, admitted less freely, by directing the vapour towards the mouth and nose, during ordinary breathing. When diaphoresis is desired as an effect of these inhalations, the ordinary or forced respiration is performed under a cover which envelops the head and the vapourable remedy. A common tea or coffee pot, containing the heated fluid, is often used—the patient inhaling the vapour by the spout. Several kinds of apparatus have been devised expressly to administer these aeriform remedies, among which, the best is that contrived by Dr. Mudge, who wrote on catarrh, which he proposed to cure by these remedies. It is called "Mudge's Inhaler."

Heated bricks are also used to vaporize watery fluids. When resins, balsams, or odoriferous gums and substances of a similar nature are used,

they are placed in a heated iron vessel, on a common fire shovel heated, and the vapour arising during liquefaction is taken in by holding the head over the vessel or utensil employed.

The simple inhalations are, aqueous vapour, that arising from vinegar, or vinegar and water.

The medicated aqueous inhalations, are decoctions of medicinal herbs, chiefly of the verticillatæ and corymbiferæ, of chammomile flowers with a little ether added, and of some bitter, astringent plants. The vapour of hot decoctions of some roots is also used; I have administered senega in this way, with advantage.

The aetherial inhalations are, the spontaneous volatilization of sulphuric and nitrous ether and oil of wine, weak dilutions of aqua ammonia, common spirit of hartshorne, the volatile refined vinegars of the shops, and similar volatile medicines.

The vapour of fragrant and stimulating balsams, are, the fumes obtained from gum elemi, camphor, benzoin, storax, olibanum, labdanum, common white rosin, burgundy pitch, hemlock gum, and the terebinthinate exudations or concretes of the coniferæ, as tar.

The vapour of nitre, sulphur, and quicksilver, are obtained by heating to the point of volatilization. The fumes of tobacco by the pipe, or burning the dried leaves or segars in a close room, by persons not addicted to the habitual stimulus of the plant as a luxury. The fumes of stramonium root, of the flowers gnaphalium margaritaceum, or common life everlasting, and various other vegetable products, have also been medically used.

MEDICAL USE OF INHALATIONS.

These remedies are in many instances true expectorants, acting as mechanical irritants, by immediate contact with the lining tissue of the lungs and passages unaccustomed to their peculiar action. Hence coughing, which is essential to expectoration, is excited, and brings up the increased secretion which follows the application of a local stimulant to the tissue it pertains to—and by this increased local excitement, a more vigorous effort is induced in the parts naturally concerned in the act of expectoration, by which the tenacious mucus already secreted and engorging the lungs, is thrown off.

The steam of hot water is efficacious in relieving the distress of paroxysms of asthma, and in inflamed tonsils and trachea; several other inhalation of class 1st. are also serviceable in the same affections. Tar vapours are useful in catarrh and phthisis, and more especially in chronic bronchitis. They cannot be employed however in acute inflammatory affections of the lungs, without injury. The inhalation of tar fumes has also been beneficial in hooping cough, according to the experience of Mr Wansbrough, of Fulham in England, and also in his hands, other affections attended with difficult respiration. Vomiting as well as coughing was induced in some children by them. Dr. Crichton, of Russia, published in 1813 an account of some experiments made with the vapour of boiling tar in the cure of pulmonary consumption. Several patients were cured by those inhalations. He restricts their use to that stage in which cough and hectic are most exasperated, observing that if they are persisted in after these are subdued, that practice would produce a teasing dry cough

and render the common air distressing to the patient. Dr. Rush attached much importance to these inhalations in consumption. I however am disposed to view them, from my own experience of their effects under the direction of Dr. Rush, on patients in my care in the Pennsylvania Hospital in 1809, and from my own repeated trials of them since in public and private practice, rather as palliative than curative agents in this disease. In the former light I deem them important and beneficial. Dr. Mudge has spoken of some cures of consumption, by the fumes of common resin. The cases are insulated. Nitrous vapours have been reported to be efficacious in hooping cough. Mr. Patterson attests their efficacy. Stramonium roots cut up and smoked in a pipe, were about 12 or 15 years since very much used, in asthma. The accounts of the efficacy of this kind of inhalation, are various and contradictory. I have extensively prescribed them in the alms house of this city, in such cases; and in some instances with great benefit, in some with less, in some without any positive effect, and in more with inconvenience to the patient. Dr. Eberle mentions that he has never prescribed them with the slightest benefit. I cannot help attributing this to the mode of administration; and I shall therefore point out, in detail, in the lectures, the proper plan.

The respiration of oxygen, hydrogen and nitrogen gasses, during the rage of pneumatic medicine, were all reputed curative and palliative. Some well attested cases of both effects are to be found in Beddoes' work on this subject, but the difficulty of employing them in ordinary practice will ever prevent their use.

As prophylactics, different fumigations and inhalations have been used. These will be detailed in the lectures.

ISSUES.

These are peas, waxed-sponge, or wax-taper, introduced into an incision made into the teguments in the neck, spine, arms, legs, thighs, side and other parts of the body, by the irritation of which suppuration is produced and continued as long as the extraneous substance used, is kept there; or they may be made by applying a small round blister the size of a twenty-five cent piece, or a dollar, and when the cuticle is removed, applying lunar or what is better common caustic, until a slough is produced, and the denuded surface kept running by an irritating ointment. The first are common, the latter caustic issues. Thus established the suppuration becomes a drain which may be continued for any length of time, by daily removing, in the common issue the inserted irritant, washing the wound with soap and water and reinserting the pea, &c.; and, in the caustic issue, by similar ablution and varying the nature of the irritating dressing. These remedies are of ancient date. The caustic issues were much used by the Greek and Roman practitioners, and their writers have commended them in gout, sciatica, chronic diseases of the pulmonary organs, the liver, spleen, epilepsy. They have, at this day, lost none of their ancient repute, but stand prominently, among the useful remedies and palliatives, of the same affections for which they were esteemed of old, and

for many others, in which the experience of modern practitioners has found them serviceable. They are surgical as well as medical remedies. Hence we find them used with efficacy in scrophulous affections of the joints, particularly those of the hips: by some along the spine in some place contiguous to diseased verterbræ. They are also used for gutta serena: incipient cataract. Their medical application is for various opthalmic affections, deafness, chronic rheumatism; rigidity and obstimate inflammation of the joints from this cause; to the back near the sacrum. for what is called sciatica; to the same place, for nymphomania; to the spine for epilepsy and palsy; to the back of the neck for tetanus, in which Dr. Hartshorne of this city has been successful in several cases by these means; to the same site for chorea, in which I can, from experience, attest their efficacy; to the side for chronic enlargements of the liver and in protracted pneumonic disease threatening phthisis; to the neck for vertigo, hemicrania, hebetude and habitual somnolency in phlegmatic constitutions; as succedanei for long continued eruptions suddenly suppressed, by reason of which the general health has become impaired—and for habitual hæmorrhoidal flux, the spontaneous cessation of which has been followed by a similar state of general indisposition or disorder. Dr. Rogers has employed them with success to prevent habitual abortion and in leucorrhœa and menorrhagia. Numerous other affections of an anomalous character accompanied with deep seated pain, from occult causes, are relieved by the salutary agency of these drains. The caustic issue is, in general, prefered to the pea-issue, in fleshy parts; the latter being mostly used near the part affected, in articular derangement or disease. I have had a great deal

of experience with the former, which I much prefer, on many accounts, to the common issue. On the whole I recommend them to your notice, as valuable, and, rather too much neglected, curative agents in general practice. Like the miscellaneous employment of epispastics, the varied affections which indicate their propriety to the reflecting physician, must be the result of experience and thought in the course of his practice, rather than the result of any definite rules for their establishment, suggested from the lecturer's desk.

LITHONTRIPTICS.

Medicines supposed to be endued with the power of dissolving urinary calculi. This is the prince of bad classes. It is an absurd and misleading aggregation of medicines according to a virtue they have not in a single well attested instance, been proved to possess, when taken into the mouth or injected into the bladder by the urethra. On the other hand, numerous instances are on record of cases of stone treated by them, and followed by a cessation of some portion or the whole of the irritating symptoms of its presence—which caused them to be pronounced solvents, since the calculus could not be felt by the sound; and yet death and dissection have brought to light the existence of these bodies, encysted. In the cases relieved by Mrs. Stephens, who received a parlimentary recompense for her asserted cure of the stone, a similar envelopment of the calculi were found, plainly proving that her vaunted remedy was incapable of dissolving them. As it has been discovered by chemists that certain substances in a state of such weak solution as to be taken into the mouth and held there, without any ill consequence, and even swallowed with impunity, are yet capable of dissolving different urinary calculi out of the bladder—it has even of late years been contended that these substances, or if not these, that some substances might be found, which could, taken by the mouth or injected directly into the

bladder, produce a similar chemical solution. No fact however, has come to light, which in any degree favours the possibility of such destruction by such means. The utmost that can, even judging from the reports of those who lean to the admission of such virtues in medicines, be with truth or reason admitted, is, that, what are called lithontriptics, may wear away the projecting asperities of some species of calculi, and by rendering them more smooth, may by this effect, render them less tormenting. Messrs. Prevost and Dumas* have attempted to solve the stone, while

* "A fusible human calculus was submitted to the action of a galvanic pile, of 120 plates, for the space of twelve hours. The calculus was placed in a vessel of pure water. The platinum wires which served for poles, touched the opposite sides of the calculus. During the action of the battery the bases and phosphoric acid came to their respective poles recombined, and the salt thus formed, precipitated to the bottom of the vessel in the from of a fine powder. Before the experiment, the calculus weighed 92 grains—after it 80 grains. The galvanism was continued till the end of sixteen hours, when the calculus presented only a friable mass, which was easily reduced into small crystalline bodies by the slightest pressure.

"The result of this experiment naturally led to another, still more curious. A calculus was fixed on a sound, between two platinum conductors, and the apparatus introduced into the bladder of a dog, by means of an incision in the urethra under the pubic arch The bladder was injected with warm water, which was prevented from returning. A battery of 135 plates was then brought to act on the wires. The animal was, at first restless, but soon became quiet, and supported the action of the pile during an hour. The apparatus was cautiously withdrawn, and the calculus showed evident marks of decomposition. The experiment was then renewed and continued six days, one hour in the morning and one in the evening. By this time the calculus had become so friable that the experiment was obliged to be discontinued. It had lost in weight proportionately to the other calculus. The animal was now killed in order to examine the state of the bladder. Nothing remarkable could be discovered in this organ.

"Our authors hope that means will be found out to apply the galvanic action to those calculi in the human bladder which are

in the bladder of the living body, by the action of the galvanic fluid, with results no more encouraging than those which have followed the internal exhibition of medicinal agents with this view. Those who favor the idea of lithic solvents argue, that they are feasible remedies, because chemistry has possessed us of a solvent for nearly every species of calculus out of the body—that some of these solvents are found in the bladder in a state little if at all chemically or materially changed from the state in which they were taken into the stomach. Now of what avail are these facts, against the omnipotent one that the supposed solvents, under all these advantageous chemical and physiological circumstances, have never yet dissolved a single stone in the bladder of the living body? As to the 'direct communication' between the stomach and the bladder, by some rout independant of the circulation—notwithstanding Sir Everard Home's ingenious experiments on the dog, its existence is purely gratuitous. He closed the pyloric extremity of the previously evacuated stomach of this animal by ligature, and afterwards introduced fluids into it tinctured by rhubarb. He detected the colouring matter of this drug in the urine in thirty minutes after. What does this prove? That the colouring matter of rhubarb gets into the urine of a dog by some other channel than through the pylorus—no more. It might as well be said, that because garlic applied to the soles of the feet, discovers its odour in the breath, that there was a 'direct communication' between the skin of the feet and the lungs. Many are the composed of saline principles—but they are aware that it would be quite useless to hope for any beneficial result in cases where the calculus consists wholly or principally of uric acid."

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inscrutable processes of the living animal system, imaginable or inconceivable, by which this, to us occult process, might be accomplished, without the aid of any direct short cut from the stomach to the bladder. Whatever communication may be there, other than what the eager and gifted eye and adroit knife of the anatomist have brought to light—must be minute indeed. But if it were possible to be, and were as large as the Thames tunnel, what would that avail? Is it that it shall permit a passage, *scot-free* of toll or mulct or diminution, of stone-solvents on their way to the bladder to break up and root out the lithic pest? Does Dr. Chapman, who enlists this argument to sustain his position that "enough is ascertained, in relation to lithontriptics, to warrant us to persevere in our trials, as well with those which we already have, as with new substances,"* forget what he has himself noticed, two pages preceding, "that these solvents have been injected *directly into the bladder* through the urethra," where "it is contended they ought to act on the stone and gradually dissolve it:" and that "he does not perceive why they should not, though the few attempts which have been made, afford us *little encouragement?*"

As to his insinuation, that the want of success in these experiments might "be owing to their not having been conducted with all the care which the case requires," and his assertion that "to succeed in such experiments, much skill and perseverance is demanded." I think it may very fairly be said, that neither is justified by fact nor probability. There is no difficulty in throwing by forcible injection, these solutions of lithic solvents into the bladder—but allowing that there was, surely

* Therapeuties—Lithonthriptics—or Antilithics.

when they once got there. no matter in how bungling a manner the operation may have been performed, that bungling would not deteriorate the chemical properties of the injected fluid. When there, it ought to act on the stone, if it were endued with a power on it in the living bladder, similar to that it has been proved to possess out of it. As to any want of perseverence in these trials, neither the character nor zeal of the experimenters renders them liable to such an imputation. They were disheartened because of their failure, and their zeal was extinguished because sufficient trials rendered it nugatory. But this incapacity for accomplishing what they are prescribed to effect, of the supposed lithontriptics, is not the only difficulty presented to the admission of such a class of remedies. Not only are innumerable instances authentically related of their total inefficiency, but well attested facts are not wanting of the rapid accresion to the calculus, during the use of *lithontriptics*. Sir Everard Home mentions the most striking examples of the latter fact. One patient took alkaline medicine as a solvent for four or five years, and at his death three hundred and fifty light spongy calculi of different sizes, nearly filled the bladder; another had an increase of the symptoms after taking mild and caustic soda for some months, and was obliged to submit to an operation, which brought forth a calculus "which was surrounded with a coat of triple phosphate one tenth of an inch thick, the rest being a mixture of uric acid and phosphate." De Haen's case of palliation and final obliteration of all the symptoms of stone, after taking *near 3 fourths of a ton* of lime-water, *near 3 fourths of a ton of milk*, and 17 *lbs*. Venetian soap, in the short space of seven months!!! —while the calculus still answered to the sound,

ought to give lithontriptics their quietus. No one, however captious, or vituperative, would surely accuse the practitioner or the patient in this instance, with a want of *perseverence!* One cannot but hesitate to whom to award the greatest praise—the Doctor for his faith and pertinaciousness in opinion, or the patient for his submission and fortitude. To conclude this subject, on which I have already spent more words than it is worth; Cullen did not believe in these remedies, and provided no class for their reception. His commentator, the late Dr. Barton, added the class Antilithica, but discarded from his lectures the idea of a veritable lithontriptic—he taught no such doctrine as the possibility of retaining such an absurd class. Dr. Paris says "after all, however, the solvent power of lithontriptic remedies must be very limited, and in advanced cases we can never expect to procure more than palliation." Dr. Eberle observes in his work on medicines "it is very questionable whether we possess any remedies capable of dissolving calculi existing in the urinary organs. The attempt at removing calculous concretions by remedies of this kind having hitherto, proved abortive, is a fact which sufficiently warrants the scepticism which prevails on this subject." Even Dr. Chapman who upholds these remedies by various remarks to that effect in his discourse on the class, in finishing the subject observes "notwithstanding all I have said, I shall not absolutely insist on the solvent powers of any substance, with which we are at present acquainted." I have already fully set forth my own opinion on the suject, and thinking it high time to cease the perpetuation of a useless and misleading class, instruct you, as far as my influence may be thought worthy to extend, that you throw the class with reference to the

reputed effects of the medicines it embraces, entirely out of your studies. I now proceed to a consideration of antilithics, which in their prophylactic effects are an useful set of remedies—first remarking that the class of lithontriptics has been noticed at all, purely that I might endeavour to remove erroneous impressions you might imbibe concerning it, from the works of Materia Medica which may fall in your hands.

ANTILITHICS.

These are prophylactics. They are such medicinal and dietetic agents, as tend to correct a predisposition to form calculus, thus preventing lithic concretions. It is supposed they exert a still more extended effect, in arresting further accresion to calculus already formed by subduing the diatheses which begun and increased it. It is possible, that these medicines and regimen, may avert the deposition of calculous materials suspended in the urine, where a nucleus has not been already formed; but the facile increase of calculus, when that nucleus unfortunately has been established, seems to render it very questionable whether the calculous taint in the digestive system can be so entirely obliterated, as to cause the urine to pass over and remain for some time in contact with the surface of the existing concretion, as to leave it without obeying its strong affinities for its homogenous materials, by depositing some augmenting particles. There appears to me a wide difference between allowing antilithic remedies and diet a prophylactic power, when calculus shall not have commenced by even a minute nucleus, and

conceding the same preventive virtue in similar medicines and regimen, when the inviting cause of deposition has actually taken its unwelcome position in the bladder. In the former case a single difficulty is to be met, the latter two are opposed. Antilithics may be equal to overcome the first, and be justly esteemed important remedies, though they are ineffectually applied to, in order to combat the second. For these reasons, and because it seems to me that an unfounded depreciation of valuable remedies and agents, is the natural consequence in the opinion of a majority of practitioners of an exaggerated attribution of powers, beyond what they really possess—I would restrict the definition of antilithics, to the terms of the first two sentences of this chapter. Before entering further into the discussion of this subject, it may be proper to observe, that, without a cotemporaneous and conjunctive observance of what I would call antilithic regimen, mere medicamental antilithics cannot avail much. This remark will be found of staunch value, when we review the whole field of moral, physical and dietetic causes, which conspire to generate and perpetuate lithic predisposition. These will be noticed in the course of the following outlines of a very difficult and I think in the prevailing chemico-medical aspect of it, a very abstruse subject. The important and instructive bearing of chemical researches and results, on the pathology and therapeutics of diseases, is in no instance so conspicuously shewn, as in reference to calculous taint, but I much fear, like all novel and high-wrought theories, the chemico-medical treatment of this taint, is pushed somewhat beyond the line which separates reason from misguided zeal, if not infatuation. The inevitable consequence of transcending this limit to rational inference and treatment predicted on the

results of chemistry, will be, a total repudiation of the whole theory and practice, carrying with it, in one condemning sweep, the judicious and the over-strained practice involved in the present theory of lithic disorders. In medicine, as in prize-fighting, we should courageously and fairly, *come up to the chalk*: a step beyond, or even half over it, is, in both instances, unfair and a fault, casting suspicion and distrust upon all subsequent movements. I cannot but think the chalk has been oversteped, by some writers, and gifted writers too, on this interesting subject. That you may not, by imbibing these tenets, to their full and prejudicial extent, compromit your future talents, industry and usefulness in the same involution of over-heated zeal, which threatens to raze the existing chemico-medical doctrine of calculus and its generative taint—I shall proceed to an exposition of the principles on which it is grounded and the pathology and practice to which it points: and then endeavour to shew my sense of that part of it which is true and feasible, and that which appears gratuitous and impracticable. The whole doctrine and its consecutive practice, is appreciable by ordinary intelligence; and nothing more than *sceptical* attention is required to understand its merits and defects—its good and its evil tendency.

A knowledge of the constituent principles of the urine, is the foundation of rational antilithic practice. Without understanding these principles, which chemistry has brought to light, the practitioner would treat the lithic taint, empirically. I proceed therefore, to call your attention to this subject, as one greatly enlightened by the industry and acumen of those medical chemists, who have devoted so much time with so much success, to this difficult subject. I need scarcely observe, that

the urine is not a simple fluid, but the most heterogeneous of all the animal fluid products. It possesses certain characteristics in its healthy state; and very quick and manifest alterations are made in these. by those morbid states of the system which affect the whole digestive process. Yet this visible change is not always produced by such a state of the system as gives us notice of its existing disorder. Not unfrequently we have no notice, from our feelings, of the existence of any morbid action, although it may have been sufficient to modify the relative proportions of the constituent principles of the urine. Berzelius analysed the urine, and the following are his results:

ANIMAL PRINCIPLES.	
Water	933.00
Urea	30.10
Lithic Acid	1.0
Pure Lactic Acid, Lactate of Ammonia, and Animal Matters not separable from these	17.14
Mucus of the Bladder	.32
ALKALINE AND EARTHY SALTS.	
Sulphate of Potass	3.71
——— of Soda	3.16
Phosphate of Soda	2.94
——— of Ammonia	1.65
Muriate of Soda	4.45
——— of Ammonia	1.50
Earthy Phosphates with a trace of Fluate of Lime	1.0
Silex	.03
	1000.00

Besides these principles of healthy urine, Dr. Prout observes that in different diseases it may contain Albumen, Fibrin, and the red particles of the blood; Nitric acid; various acids, which are found to be modifications of the Lithic; Oxalic acid; Benzoic acid; Carbonic acid; Xanthic oxide; Cystic oxide; Sugar; Bile; and Pus.

Urea is peculiar to the urine: is produced by the action of the kidnies on the blood. Dr. Prout suggests that they get it from the albuminous matter.

Lithic or uric acid, is not found in the blood, but is always present in healthy urine. Majendie thinks it is obtained from the azote of alimentary substances. Dr. Prout thinks it is always in combination with ammonia. (lithate of ammonia) from which acids, even carbonic, separate it in the form of a red powder.

Erythic acid is a peculiar acid so named by M. Brugnatelli, obtained by treating pure lithic acid with diluted nitric acid, applying a moderate heat. It is in transparent colourless crystals.

Purpuric acid; this is obtained from the the Erythic acid crystals, treated by Prout, while in a state of boiling hot solution, with pure ammonia, which produces crystals of purpurate of ammonia. These heated by potass and sulphuric acid, yield pure purpuric acid in a yellowish powder.

The phosphoric acid and its compounds are active agents in the production of calculi. This acid often exists in a free state in the urine. In healthy urine it is in union with soda and ammomonia, and partly with lime and magnesia; these last being retained in solution by excess of acid.

Dr. Prout, divides the mechanical deposites from the urine, in three classes:

1. Pulverulent, or Amorphous sediments.
2. Chrystalline sediments (called gravel.)
3. Solid concretions, (or calculi formed by concretion of class 2.)

The first of these classes cannot enter into the view of a discussion of antilithics—against the the formation of the second and third class, these antilithics are calculated prophylactically to be useful.

The urinary calculi, according to the chemists, contain in their composition the following bodies:

1. Lithic acid.
2. Phosphate of lime.
3. Ammoniaco—magnesian phosphate.
4. Oxalate of lime.
5. Cystic oxide.
6. Xanthic oxide,

to which may be super-added, the animal ingredient which cements the whole together.

There are two taints of the digestive system: the lithic acid, and the phosphatic taint. It is needless to observe that neither of these is healthy. True health, in reference to the digestive process, consists, in as far as the urine is concerned, not in the absence of an excess of the principles of either lithic acid, or phosphatic elements, from that fluid—but in the absence of ability to hold these excesses in such a state of solution, that they shall freely pass out of the body. When such suspending power is, by any very deranged action of the healthy digestion, taken away, deposition then takes place: and a clot of blood, the result of previous inflammation of the part; or indeed any foreign or morbid body, however small at first, presents a nucleus of this deposition. Herein consists the mischief. A continuance in the system of the perverted actions which have thus laid the foundation of concretion, of whatever kind, under either taint—allows perpetual, though very gradual accresion, until large or small calculi are en-

gendered. If therefore there be any remedies of a medical kind, or any system of diet, which, by their united effects, can have a tendency to keep down the excess of calculous principles below the depositing point; or, which, that having once been transcended and deposition on a nucleus having taken place—are calculated to protect the digestive function from further perverted action; then the first small concretion may be spontaneously broken up by the returned healthy action, and passed away—and the remedies and the regimen producing these effects, may truly be entitled antilithics. It may here be asked, what light chemistry has thrown on the proper application of these antilithics? It is by affording us data in the examination of the urine, on which to decide as to the presence of one or the other taint, or, as it is commonly called diathesis. How can such an examination or analysis of the urine do this? It is by development of the existence of the excess which is called lithic acid diathesis, or that of the phosphatic. And of what use is it to know which of these is prevalent? It is by directing us to use that set of antilithic remedies suited to remove or moderate the one prevailing: for they require two very different kinds of remedies; and that which would cure or moderate the lithic acid taint, would increase the phosphatic, and vice versa. In other words, some varieties of calculous principles in the urine will be liable to be affected by acids, and other calculous principles by alkalies. The medicines therefore prescribed as antilithics, will cause a cessation of morbid action in the kidnies, or increase that already existing, according to the just adaption of the remedy to the prevailing taint, or the improper selection of one ill-suited to remove it. Dr. Marcet has observed, that

"whenever the lithic acid predominates, the alkalies are the appropriate remedies, but that when the calcareous or magnesian salts prevail, the acids are to be resorted to"—a remark which presupposes the recent urine to have been examined, its sediments scrutinized, and, if necessary to confirm our knowledge derived from such scrutiny, an actual analysis of these sediments, by chemical tests. It is here that the chemico-medical pathology becomes so deeply interesting: here that judicious treatment becomes so materially dependant on the enlightened view of urinary disordered function, presented to the profession by the labours of Prout, Marcet, Brande, Wilson Philip, Wollastson, Majendie, and others.

In what condition of the system does the lithic-generating process originate; and what practical deductions can be made from knowing that condition? It is obvious that the chain of actions, which binds all the relative individual processes of the body conspiring to make the entire digestive process as it is called, must every link be sensible to the contiguous and continuous morbid impulses, the effect of which is to pervert in an especial and perceivable manner, the fluid it is destined to secrete, though less important aberrations from healthy action are induced in other functions. Whatever course of diet, dress, habits, or whatever moral causes may, by the individual effect of either, or the collective operation of the whole, tend to derange, impair or destroy the healthy functions of the stomach and intestines, the liver and the skin, must, in consequence of the catenation of the functional actions of all these, with the kidnies, be a cause of lithic disease. And this will be the case in a greater or less degree, in proportion to the presence in, or absence from

the system, of an original predisposition from hereditary, constitutional or accidental taint, to lithic disorder. Accordingly we find, that dyspepsia is the proximate cause of lithia; and the causes of dyspepsia, whether moral, physical or accidental, are the remote causes of the same morbid state of the system. And whatever hereditary predisposition may exist, to dyspepsia, as in persons deriving arthritic taint from their parents, that predisposition will be found especially subject to lithia. Hence gouty persons, whose digestive process, in early life, is not so entirely impaired by the irruptions of frequent attacks of irregular gout: and who for that reason escape the early promotion of lithic disease, unless they have been addicted to intemperance and great irregularity of habits—are nevertheless, in more advanced age, very subject to lithic productions: because dyspepsia then supervenes to the frequent arthritic paroxysms which inevitably make their unwelcome appearance at that climacteric. The practical inference deduced from these facts, is, to direct our curative intention by constitutional general remedies, calculated to restore the lost, rouse the torpid, or reinstate the perverted functions of the stomach. And this we are to do, while we simultaneously administer antilithic remedies, on the principles already mentioned—suited to remove altogether, or suspend, the further production of lithic urine, by their peculiar local determination to the kidnies. We are thus brought to the conclusion, that antilithics, as prophylactic and palliating remedies, are not empirically used; but are administered on principles of correct pathology, chemical fitness, and philosophic intention. As such I invite your attention to them: but do so at the same time that I urge a devotion to study of

the chemico-medical investigations of the authors already mentioned; and, above all, to study quite as closely, the approximating traits in these works, to speculation somewhat too refined to be without danger of error—to practical directions somewhat too highly wrought out of overstrained chemical results, to be easily and profitably enlisted in our ordinary practice. This, I trust wholesome caution, is not intended to convey any detraction from the value, either of the investigations or practice predicated on them, to the importance of both of which I have clearly testified in the preceding outlines. Nothing can be more true, than the leading principles of physiognomonical deduction made by Lavater, in his treatise on a subject philosophically handled by none but himself: yet nothing can be more absurd, unfounded and fine-spun, than some of his decisions in favour, and predictions against intellect—founded on a thread drawn to fragility by too many turns of the wheel, and too extended a walk from the spindle on which it is wound. The warp of the chemico-physiologico-medical doctrines of lithia, like the principles of physiognomy in Lavater, consists of threads well disposed, and of woof fitly adjusted in the loom: but the filling has been too fine and too injudiciously interwoven, to render the texture of the fabric durable.

OUTLINES OF ANTILITHIC PRACTICE.

Dr. Wilson Philip has made the following deductions of the effects of diet, in generating lithia.

"1.—That acid and acescent matters, tend to increase the deposition of lithic acid from the urine, and to prevent that of the phosphates.

2.—That diet composed of a large proportion of animal food tends to lessen the deposition of lithic acid, and to increase that of the phosphates.

3.—That every thing which promotes the action of the skin, tends to prevent the deposition of lithic acid, and to occasion that of the phosphates.

4.—That dyspepsia tends to increase the deposition of the lithic acid, and to lessen that of the phosphates, both by producing acidity in the primæviæ and by rendering the skin inactive.

5.—That indolence has the same tendency both by inducing dyspepsia and by lessening the activity of the skin, in proportion as it impairs the vigour of the circulation.

6.—That an acid passes by insensible as well as sensible perspiration."

Since these effects of diet embrace the two prevalent taints of lithia, it is plainly the duty of the practitioner to enquire minutely into the errors of repletion, which have had the effect of disordering or violating wholly, the process of healthy chylification. It is equally his duty to enforce rigidly, such amendment in the unwholesome ingesta, as may be calculated to restore the healthy functions, on the morbid aberrations of which, lithia depends. But he must not stop here. The moral causes already hinted at, are actively prejudicial. Excessive mental exertion or excitement, grief, anxiety, nervous irritation induced by intemperate indulgence of passions—all exert a ruinous action on the digestive functions, and it has been shewn, consequently, in the production of lithia. Physical causes, as irregular repletion, interposed with protracted fasting; or any other irregular alternations of excess and deficiency, take their part in the morbid conditions favourable to lithial depositions. Mechanical irritants, as injuries done

to the back by over-straining, blows, falls and the like, have, in systems characterized by predisposition to the affections under notice, the effect of exciting causes, both by causing an establishment of some of the nuclei, of calculus, engendered by local violence, and by inducing morbid action in the kidnies. On the alert to discover some or all of the preceding causes. the physician is prepared with some prospect of success to meet them by curative or palliative directions and remedies. Among the latter, the chief alkaline are magnesia and magnesian salts; and the alkalies, fixed and volatile; the vegetable and mineral acids, carbonic acid; the alliaceæ; some astringent diuretics; certain resinous narcotics; many bitter tonics; all of which will be designated for their particular effects, in the second volume of these outlines.

NARCOTICS:

CALLED ALSO

SEDATIVES; ANODYNES; HYPNOTICS; SOPORIFICS.

Substances endued with intense power on the general, but especially on the nervous system and sensorium, inducing a primary vivid, but evanescent excitement; and a secondary depression below the point consistent with customary action of the cerebral functions, and vital powers, and hence inducing sleep, insensibility and torpor. These primary and secondary effects are perceivable in all narcotics, properly so called, but they evince no determinate relation as pertaining to each individual substance. The same narcotic at one time producing but slight primary effect, with intense secondary action: while at another the primary effect is the most vivid, and the secondary is disproportionately inconsequent. If particular narcotics evince this discrepant strength of their first and second effects, at different times on the same person, they discover a still greater variation in relative consequences, administered to different individuals. There is no class of remedies which is so materially affected by peculiarities of constitution, not to say idiosyncracies; by accidental circumstances; by moral and physical excitement, as the one under notice. And I may assure you, that no class requires closer study and attention, in order to avail yourselves of all the

advantages, and to be on your guard against all the inconveniences, which its multifarious subjects present. The primary stimulant operation does appear. from its transitory effect. to be often really trifling: while the depression ensuing immediately after. being excessive, many have denied altogether, a stimulant effect to the substances thus acting; and have called them direct sedatives. Hence you will find that Cullen speaks of the subjects of this class, as sedatives, refering the incitant power which he could not but perceive belonged to their first impulse, to the *vis medicatrix naturæ*, which makes an effort to rid the vital powers of the intruding agent threatening to suspend or destroy them. The celerity of accession of the secondary effect, which we designate in common parle by the word narcotic, seemed to him to give much strength to the idea of immediate sedative action—an action he considered as the sole one produced by the tribe of agents now refered to a distinct class called narcotic, but which he designated as the first section of his class Sedantia, embraceing such sedatives as he maintained to act "more immediately on the nervous system" while the second section 'Refrigerants,' he conceived to have an effect "more immediately on the sanguiferous system." His theory of the operation of his first section, which he also called soporifics and hypnotics, is, that as all sense and motion are derived from the brain: and that as these medicines diminish motion and power not only in parts to which they are directly applied, and which are remote from the brain, but also produce a similar diminution of sense and motion when applied to parts having no connexion with the brain—that they must do this by acting upon some matter

in common to the whole nervous system. This matter he maintained was "a subtle elastic fluid inherent in the medullary substance of the brain and nerves. upon the motions of which all sense and vital motions depend ; and by which, therefore motions are communicated from every one part to every other of the nervous system." He believed that there were certain phænomena which evinced an excessive degree or a relative paucity of this fluid, at different times ; and that it was liable to be affected in these respects by external bodies applied to the nerves. He believed that narcotics diminished the mobility of this nervous power, and that in a certain quantity they destroyed it altogether. This is his theory of the operation of what he called "narcotic sedatives." I hope I shall not startle you when I declare my belief in the existence of "narcotic sedatives" which act in some inscrutable manner on the vital powers. and may be, in the manner so ingeniously accounted for in the beautiful hypothesis of Cullen. I would incline however to the still more philosophic and beautiful doctrine of complex and inter-sociated sympathies, to come at the same conclusion. The fact alone, however, is all which materially interests us at this time : and as I assume it as undeniable, that cold water taken suddenly into the stomach of a person over heated, and prussic acid given to one under any circumstances of ordinary existence, do produce effects not referable to the same mode of action belonging to the incitant narcotics, I shall dispose of the deleterious principle just named in a distinct class, in Murrays arrangement modified, under the name of SEDATIVES. I shall assume the prussic acid as the type of this assemblage, and it will be perceived I am not without legitimate resources to make a goodly number

of such agents as act in a manner somewhat similar. To me it has long appeared plain, that in our pruriency to divest our minds of old opinions in reference to the operation of medicines, we have unwittingly, but very naturally, fallen into a dilemma. We were not satisfied with the hypotheses of the writers of Cullens' time, because they did not square with all the effects of a multitudinous class—and we in consequence eagerly seized on the "incitantia" of Darwin, to lead us from the difficulty, because most of the narcotics, are incitants: not recollecting that several agents in the class of Cullen's sedative narcotics, are characterised by effects quite as anomalous and difficult to reconcile with our present received notions of the effects of narcotics, as many of his class were with the principles of his own disposition. The class of sedatives which I propose to restore; will embrace medicines and agents equivalent to the "*contra-stimulants*" of the Italian school. And if in the restoration of a long disused, and a much abused name, I may be unsustained by the prevailing tenets of the day—I am, certainly in my own opinion, and I venture to believe by the confession of all who have devoted any thought upon the subject of these lectures, most strenuously supported: and intrenched by the known difficulty of getting on without it. If there be no sedatives, or agents which act according to an operation on the system designated by the usual acceptation of that term, then surely we have some medicines without a name, which cannot be arranged in any of the classes of the present received systems of arrangement. I admit the acknowledged difficulty of disciplining narcotics—I believe them in the anarchy and confusion of raw recruits sent into the forces of remediate agents—but I believe a detailed guard

might receive, and control the refractory, which may refuse to fall in the ranks and obey the movements prescribed to each company—that office I shall assign to sedatives.

It has been discovered by the researches of Saturnier Derones and Majendie, that the narcotic principle of opium is separable from the other principles of that substance: and they have given to this principle the name of narcotine. Deprived of this principle, opium becomes a different remedy, and much of the inconvenience and distress occasioned by its use by some persons, is prevented.

For further details on this subject I refer you to the outlines of the lecture on opium.

The practical application of the subjects of the preceding remarks, to the treatment and cure of diseases, it is impossible to set forth in the abstract general view of the whole aggregation, for reasons already given—their various effects. The medical use will be more properly and efficiently shewn, in the discussion of the peculiar properties and effects of the individuals constituting this group. This point will be attended to in the lectures.

REFRIGERANTS.

'These are remedies which have been supposed to diminish the heat of the body without occasioning diminution of sensibility or nervous energy. It has been assumed that they do this whether internally taken or externally applied, by acting with an immediate reducing force on the sanguiferous system. They constitute the second section of Cullen's class of sedantia. After an attentive review of the grounds on which this class has been established and continued—after duly weighing the facts and phænomena, chemical and physiological, which have been brought in support of it—after surveying the wide field of hypothesis and conjecture, on which these facts and phænomena have been martialled into an arrayed force to compel an accrediting consent to the real existence of remedies which generate cold in the body—after pondering on Dr. Crawford's doctrine of the chemical origin of animal heat: and that more generally recived theory supported by Brodie, of the inherent principles of animal heat co-existent with and dependant on the living principle which animates the frame; both of which theories are intimately involved in the course and bearings established for the operation of refrigerants—after reflecting on Brockley's observations, predicated on the phænomena of the chemical solution of the neutral salts—after attaching as much importance to Turberville Needhams theory of an expansive

force and resisting power every where in nature: and Cullen's intrenchment of the modus operandi of refrigerants behind the application of this antizymic power as he terms it, to the exhibition of neutral salts to the stomach ;—after devoting in a word as much reflection to this intricate subject as its complexities required: and bringing to my aid what practical experience my opportunities have in near twenty years afforded me, of the operative phænomena of medicines on the body—I am not able to perceive the slightest shadow of reason for allowing the existence of any such remedies as internal refrigerants. Consequently I enjoin an obliteration from your minds, of the misleading practice to which the admission that there are such, tends, when you pass in review the multitudinous subjects of Materia Medica. I shall enter more into detail on this point, in the lectures ; in the mean while I wish to be understood, that I not only admit of such a set of remedies and agents of therapeutic power, as may be grouped under the title of topical external refrigerants, but I believe such remedies could find no suitable place under any other name. And hence though unfriendly to classification, purely as such, yet I believe that method of the mind which groups by a catch-word, (if I may resort to the stage for a figure) an assemblage of articles producing a singleness of effect, and an undeviating fidelity in its production when applied under the same circumstances—may be useful in a practical point of view. Such a group I believe topical refrigerants to be, and they are the more constant in their operation and consistent in their effects, because they are influenced by chemical and physical principles. It will be perceived that in the second volume of these outlines I sometimes speak under "*medical property and uses*"

of the articles, of the virtues being "refrigerant," by which I would be understood simply to use the common parle of practitioners, without admitting its propriety: and I would, in such and other instances when I employ the terms of classes in the legitimacy of which I cannot believe, be alsō understood merely to designate that effect, primary, secondary, or remote, which has been noticed by authors, without conceding the propriety of the terms, or the veritable existence of such remedies as those terms designate. I proceed now to the class I propose to stand in lieu of refrigerants.

TOPICAL REFRIGERANTS.

These are chemical compounds or products, or natural agents *externally* applied to such parts of the body as may be marked by superficial inflammation: and which tend to reduce directly the increased activity of the vessels of the part inflamed. I will not say, that a reduction of general temperature may not be the consequence of these remedies, thus externally, but more generally applied to the surface when no superficial inflammation exists. But I would say, that it is chiefly in cases of actual inflammation, as in burns, scalds, erysipelatous and phlegmonous heat, that they are to be resorted to as remedies.

The substances I would dispose under this class, are

1st. Chemical compounds, as ether, or etherial spirits, which generate coldness by their evaporation; and

2nd. Natural fluids and products, as cold water, ice. Articles operating in the manner either of

them do, will also properly fall in here. The subject will be more extensively discussed in the lectures, and the practical application of these remedies pointed out by facts and illustrations. These substances and agents thus collected under the title above, should more properly be considered among the, "adventitious remedies" which I have noticed at the end of the discussion of therapeutic medicaments. I shall accordingly mention the title there, and let the foregoing hints of the subjects pertaining to it, be considered as all I have room to advance in these outlines.

RUBIFACIENTS.

These are irritating substances applied to the skin, which excite its vessels to a slight degree, I will not say of inflammation, but something approaching to it. designated by the redness which follows their application: and hence the term. They are certain acrid substances chiefly from the vegetable kingdom: as Arum, Mezereon. Ranunculus bulbosus and R. acris, mustard, horseradish, horse-mint, skunk-cabbage, capsicum, (different species.) garlic and some other alliaceæ and bulbiferæ: the essential distilled principle of resins, as oil of turpentine, oil of horse-mint, oil of tansy, pennyroyal, and several of the verticillatæ; some peculiar substances, as camphor and its tincture, aqua ammonia, &c. In short every thing which blisters, applied with that effect, may be so managed as to procure a moderation of that vesicating effect, so as simply to redden the skin, thus becoming rubifacients. Dr. Paris has refered rubifacients, to a collection of agents called Liniments. from the operation and mode of application of which, I think they differ in so many material circumstances, that I cannot accord with him in this disposition. I preserve therefore the name at the head of these hints, to designate articles which operate in the manner those already mentioned do: and refer to liniments, such substances as are characterized by the discrepancy of application and effect just hinted.

Dry-cupping is placed with this assemblage, not because I have no other place to consider it as a therapeutic agent, but because it produces the same local excitement of the blood vessels in the skin and its vicinal parts, which is effected by other rubifacients, and which that name so faithfully identifies. I consider that Burgundy pitch, and similar substances usually placed here, produce a very different effect and in a different manner—pustular eruption being generally the consequence of their continued application, as is usual with this and similar substances, and by which continued action it is deemed justly, they produce all their good effects as counter-stimulants. I have also placed tartar-emetic ointment, or this medicine applied externally in some other of the now common ways, among what I have called pustulating irritants. Where else should I place it? Surely not with epispastics! it does not produce any effect analogous to those agents. With rubifacients? Clearly not. These excite heat with rednesss of the skin only—this is far from being the effect of tartar-emetic externally applied. With liniments? Impossible. It appears to me that the peculiar kine-poc looking eruption which follows tartar-emetic externally applied, has been overlooked in the history of therapeutic agents, by authors of treatises on materia medica. They arrange it erroneously too, with epispastics and rubifacients. It is however so much employed and is really so important a remedy, that I have thought proper to refer it to some assemblage of remedies, of the effect of which its peculiar operation may be considered the type.

SEDATIVES.

These are agents which directly, and without evacuation, diminish the muscular actions, cerebral functions, and visceral operations of the human system. I have already, under the outlines of the class of narcotics, stated my belief of the existence of such agents. I am sustained by facts, by physiology, by the known effect of certain medicaments and therapeutic agents, in restoring this old class. I do not hesitate to aver, that, without it, those who advocate classification will be sorely puzzled, to know where to refer hydrocyanic acid and the medicines which operate by this principle, arsenic, corrosive sublimate and other poisons of a similar character; digitalis, hyocyamus, belladonna, &c. These I place here, as also nitre, borax, some of the mineral and vegetable acids, and other articles usually termed (general refrigerants.) The leading articles of the assemblage I refer to this title, are capable, in undue quantities, surpassing in any considerable degree their proper dose, of producing such a depression of the vital powers, as may be incompatible with the continuance of their action, and consequently producing death. Without this class, those who advocate systematic arrangement, would in vain strive to dispose of the agents already enumerated, and others of a similar character. At all events the term will afford a word to eke out the language of materia medica, which, without it, would be imperfect.

Further details and illustrative examples will be given in the lectures.

SETONS.

These are artificial drains similar to issues, and differing chiefly in their being inserted between a considerable nether surface of the skin and partially of the teguments beneath it, and the muscle. The skin is pinched up into a fold with the fingers of one hand, while the seton needle mounted with a skein of silk, a piece of broad tape, or several strands of narrow tape, is pierced through the duplicature by the other hand, and the silk or tape carried along with it. A loose tie is then made of the ends, and an emollient poultice applied for six or eight or ten hours, or, until suppuration has commenced. It is kept up by drawing the inserted material daily so far out of the wound, as to expose the part covered by it: it is then washed clean with soap and water, a mild dressing applied, and the succeeding day is drawn through the other side to its first place: and this treatment is necessary to be pursued as long as the seton is supposed useful, or until its discharge spontaneously ceases, or at least is so inconsiderable as to be inefficacious. It has been supposed that setons are preferable to issues, because we can gradually lessen the discharge by removing strands of the silk or small tape, until the whole be taken out; thus avoiding the inconvenience and even danger which it is asserted has sometimes occured, by suddenly stopping the discharge of the common issue by removal of the irritant body.

There may be some reason in this, though I confess I have never seen such results. Allowing it to be so, the caustic issue can be managed pretty nearly as well as the seton, so as to lessen gradually its purulent evacuation, by a cautious attention to the nature of the dressings applied with a view to heal it. The mere introduction of the seton is not more painful than venesection, if adroitly done with a sharp needle properly furnished with as much silk or tape, as will readily pass through the wound it makes: but the subsequent inflammation is often considerably distressing, and after some time the irritation conveyed, in peculiar habits, to the general nervous system, is intolerable. Besides this, they are more troublesome in the dressing, frequently requiring in warm weather, two or three ablutions in twenty-four hours Applied to the nape of the neck, they produce more stiffness than caustic issues, which is particularly inconvenient from its impeding the free rotation of the head. Notwithstanding all these inconveniences however, they possess some advantages over issues, common or caustic; and according to my observation, they induce a greater drain. They may be introduced even without the consciousness of the patient, who alarmed at the slightest incision by a knife in the teguments or muscles, would resist the further progress of the operation. They are used for the same purposes as issues.

SIALOGOGUES.

These are usually defined by authors to be general and local stimulants which increase the salivary discharge. I divide them into two groups, the 1st, I leave as I found them under the above title. Sialogogues—by which I mean such medicines, as, internally administered, produce among numerous other stimulant effects, a peculiar stimulant impulse on the salivary glands, by which an increased flow of their secretion is established, and for some time continued. The 2d, I shall designate by the term salivant-masticatories. It is with the first class I have any thing to do here. Mercury, by which I mean all the salts of that body, is the only true sialogogue which has as yet come to our knowledge. It is true nitric acid, and other medicines have been said often to induce this effect: yet it appears doubtful if such substances do this, by being taken into the course of the circulation, as mercury decidedly is, and through this course stimulating the salivary glands to pour out considerable quantities of saliva. At all events, admitting that such substances do often induce ptyalism—no one would hazard the assertion that they always, or for the most part do so: indeed such effect is of exceedingly rare occurrence, comparatively with the innumerable exhibitions in various forms, for various affections, of the anomalous salivant substances in question. An accidental or an unusual effect of a medicine can never

entitle it to be ranked with others which always, or with rare exceptions, induce that effect. Mercury therefore stands insulated in the materia medica; first, because it is a universal stimulant which no other medicine is; and secondly, because internally taken or externally applied by frictions of ointments made of it, it establishes a powerful excitement in the secreting and excreting functions of the salivary glands. The lecture on this subject therefore, will embrace all that is peculiar to the effect of sialogogues; and to that I shall for the present, refer you. for the theoretical views and practical application of this MASTER-MEDICINE.

SALIVANT MASTICATORIES.

These I shall assume are external stimulants, which by immediate contact with the excretory ducts of the salivary glands, excite the glands themselves to an increased action. They are taken into the mouth and masticated, but no part of their juices is swallowed: or at least it is not necessary to their salivant effect that this should happen. They are consequently, local remedies, of specific determination to parts within reach of a limited sphere of local impulses. There is no theory required to account for a self-evident fact, arising from an evident cause: and which can arise, in the present instance, from no other. There are two advantages arising from the introduction of this class: the removing from the company of mercury, the imbecile mimics of their power, which have no claim to real consanguinity—and the provision

of a suitable place for the reception of those outcasts of the sialogogue family. They are entitled to this attention, even in a practical point of view, because they are, without doubt, useful palliatives if not remedies. I shall enter more fully into this subject, in the proper stage of the course of lectures, and with these outlines dismiss the subject, first enumerating some of the pungent acrimonious substances which I believe are properly located in this class, as examples, viz. Pyrethrum; Mezereum; Tobacco; Horse-Radish; Senega snake root; Indian turnip, &c. &c.

TONICS.

Substances which give strength to the system. They do this chiefly by their continued exhibition. I confine this definition to absolute tonics—or those endued with the tonic power inherent in them, and evinced under any proper circumstances for their use. I shall not consider here, such remedies and means, as, in themselves, are any thing else than tonics, but which by their operation on the system under certain circumstances, produce indirectly an invigorating effect—in other words give tone to the system. They, relatively to the condition of the body for which they have been applied, act eventually as absolute tonics do—but it would create confusion of terms and ideas, and be subversive of the unity of the subject to notice any such as tonics. It is far from settled into any thing like a uniform belief, in what ways tonics do act. It is in truth, after all which has been advanced on the subject by Gregory, Cullen, Darwin, Barton, Blane, Paris and a host more—purely speculative, whether they operate by the bitter principle, the astringent principle, a specific determination on the muscular fibres, &c. &c. I shall enter fully into a consideration of the different theories which have been proposed on this subject, in the lectures—in the mean while I may simply state in these outlines, that, there is no class of remedies or means, the effect of which is so palpable, so generally understood and appreciated,

while the rationale of that effect is so hypothetical. It is enough to distract the tyro, to attempt to propound the contradictory opinions on this point: and it is more than enough to divert his attention from the main feature of the class—the therapeutic application of these remedies. I shall endeavour by familiar illustration to fix your attention on this point, when treating of the various medicaments which belong to the head of these remarks. For the present I have only to observe that tonics are forbidden in all states of the system involving undue arterial action—and the instances are so few, in which a deviation from this rule may be proper, that they may profitably be passed bye, until your experience at the bed side, shall give you those lights to direct a safe aberration, which mere abstract reasoning or discourse can never afford.

This may be a proper place to recapitulate the sectional division of positive tonics, which I have already proposed page 39 of these outlines, viz.

1. Simple tonics.
2. Bitter tonics.
3. Astringent tonics.
4. Aromatic tonics yielding essential oil.
5. Warm tonics, or those possessing aroma, but yielding no essential oil; or if any, not communicating the whole of its effects to the system, as when exhibited in the native state of existence in the substance itself.

I shall fill up these outlines, by a full exposition of all the substances pertaining properly, in my estimation, to each of those sections—and I shall do this the more carefully, because I believe and shall endeavour to shew, that important practical inferences are deducible from this disposition—The extent of the class; the variety in the promi-

nent principles of its subjects, and the diverse modes of their primary effect on the system, though all leading to the same ulterior issue, are facts which impress the necessity of this course, strongly on my reflection.

Having thus sketched the outlines of the therapeutic part of our course, so far as actual medicaments are in question, I proceed to review what has been said in the foregoing pages, by recapitulation—and finishing the subject by outlines of therapeutic agents not medicaments.

RECAPITULATION

Of the classes proposed in these outlines to be retained; and a scheme of those additional therapeutic agents, not properly medicaments, but which form a very necessary part of curative means, and should never be lost sight of by the reflecting and philosophic physician.

1. Antacids.
2. Antispasmodics.
3. Anthelmintics? (of doubtful claims.)
4. Aromatics.
5. Astringents.
6. Cathartics.
7. Diaphoretics.
8. Diluents.
9. Diuretics.
10. Emetics.
11. Emollients.
12. Epispastics.
13. Errhines, or Sternutatories.
14. Escarotics.

15. Antilithics.
16. Narcotics.
17. Pastulating irritants.
18. Rubifacients.
19. Sedatives.
20. Sialagogues (internal.)
21. Salivant Masticatories.
22. Tonics.
23. Toipcal refrigerants.

It will be perceived I have lessened the number of classes in Murray's arrangement by four assemblages. His is the simplest arrangement, and contains fewer classes than any systematic classification, except Darwin's, with the principles of which I cannot accord. I have added five classes: *Aromatics*—*Sedatives*.—*Salivant Masticatories*.—*Topical refrigerants*—and *Pustulating irritants*. I have expunged, *Expectorants*—*Refrigerants*,—*Emmenagogues* and *Demulcents*: and I have assumed the class of *Antilithics* in lieu of *Lithontriptics*. With this modification of twenty-three instead of twenty-two classes. I leave the subject of classification of medicaments to proceed to notice what I shall denominate "Adventitious therapeutic agents, not medicaments:" in the proper sense of the word, and to this assemblage I deem proper to refer Emollients. Epispastics, Escarotics and Demulcents, of Murray's scheme—modifying this latter class, into *Local* Demulcents. This will reduce the twenty-three classes retained and proposed—to fifteen of true medicaments. The following scheme will exhibit the points of the recapitulation, and the anticipatory view of the adventitious remedies.

CLASSIFICATION OF MEDICAMENTS.

(Proposed by W. P. C. B. in lieu of Murray's scheme.)

A.—GENERAL STIMULANTS.

Sialogogues (Mercury and its salts only.)

a. DIFFUSIBLE. { Narcotics. / Antispasmodics.

b. PERMANENT. { Aromatics. / Tonics. / Astringents.

B.—LOCAL STIMULANTS.

Emetics.
Cathartics.
Diuretics.
Diaphoretics.
Anthelmintics?

C.—GENERAL SEDATIVES.

(Hydrocyanic acid, as the type: including therefore every thing acting like it on the system.)

D.—CHEMICAL REMEDIES.

Antacids.
Antilithics.

E.—MECHANICAL REMEDIES.

Diluents.

CLASSIFICATION

ALPHABETICALLY ARRANGED, OF

ADVENTITIOUS REMEDIES NOT MEDICAMENTS.

(Proposed by W. P. C. B.)

SECTION 1st,

Belonging to division (A.) of Synopsis beginning these outlines.

1. ACUPUNCTURATION OR ACUPUNCTURE.
   Topical resolvent stimulant agents.

2. AFFUSIONS. { Topical stimulants involving general action by sympathy.
   - *a.* By velocity with ordinary temperature of water.
   - *b.* By velocity with ordinary temperature and paucity of fluid in a partial stream.
   - *c.* By velocity with reduced temperature and quantity of fluid.
   - *d.* By either of the above with the addition of nitro-muriatic acid; vinegar; ether; &c. &c. in which case they are medicated.

3. BATHS:

Simple and Medicated. { External stimulants of secondary general effect.
- *a.* Cold.
- *b.* Tepid.
- *c.* Hot.

4. Cataplasms, (called also Poultices.) } Topical stimulants or emollients, according to the nature of the substances of which they are composed. Their secondary effect is tonic, revulsive, relaxing, or promotive of suppurative action according to their nature.

5. Cold,

In form of ice or currents of air.

a. Topically or partially applied.
b. Generally applied.

Internally and externally, applied; when externally are refrigerant impulses, of secondary general tonic effect; when internally, as by swallowing ice, iced waters, or by introducing ice into the uterus for hæmorrhage—topical astringents.

6. Douche.

a. By fluids.
b. By vapour.

Topical stimulants of secondary general relaxing effects—may be so managed as to induce a secondary roborant effect.

7. **Electricity.**
Vivid general stimulant locally applied to the uninsulated body, or generally, by insulation on a non-conducting substance.

8. **Embrocations.**
Topical, resolvent and relaxing stimulants.

9. **Emollients.**
Topical stimulants, of secondary relaxing effects.

10. **Enemata.**
- *a.* Aqueous.
- *b.* Oily.
- *c.* Mucilaginous.
- *d.* Mixed.
- *e.* Medicated.
- *f.* Æriform.

} Clysters.

Topical evacuant stimulants.

11. **Epispastics.**
Topical vesicating stimulants.

12. **Errhines or Sternutatatories.**
Topical sero-mucus evacuant stimulants.

13. **Escarotics.**
Topical destructive stimulants, including actual, cautery and moxa.

14. **Fomentations.**
Topical resolvent stimulants.

15. FRICTIONS.
    a. Dry.
    b. Wet.

Topical, diaphoretic or sudorific stimulants.

When dry, by hand-rubbing, with or without a woollen glove, by flannel, by the flesh-brush, and the like.

When wet, by the same means, uniting a stimulant or lubricating fluid, with the mechanical effect of rubbing.

16. GALVANISM.

Vivid general stimulant topically applied.

17. INHALATIONS.

Topical expectorant stimulants.

18. ISSUES.

Topical draining stimulants.

19. LINIMENTS.

Topical lubricating stimulants.

20. LOTIONS.

Topical refrigerant stimulants.

21. LOCAL DEMULCENTS.

Topical obtunding remedies.

22. PEDILUVIUM, (or foot-bath.)
    a. Warm simple.
    b. Warm medicated.
    c. Cold simple.
    d. Cold medicated.

Also other partial baths.

Topical, diaphoretic and revulsive stimulants.

24. PERCUSSION.
Including shamooing, thumbing, kneading, &c.

25. PRESSURE.
By bandages and ligatures.
Topical revulsive stimulants.

26. PUSTULATING IRRITANTS.
Topical stimulants, acting like epispastics, but more vehemently.

27. RUBIFACIENTS.
a. By medicamental irritants, externally applied.
b. By dry-cupping.
Topical cutaneous stimulants, acting by exciting slight superficial inflammation in the vessels of the skin and contiguous parts.

28. SEMICUPIUM.
External diaphoretic and revulsive agents.

29. SETONS.
Topical draining stimulants, like issues.

30. SINAPISMS.
Topical irritating stimulants, acting secondarily as revulsives.

31. SPONGING.
a. With cold fluids.
b. With hot fluids.
c. With alcoholic fluids.
d. With medicated fluids.
Topical, relaxing and diaphoretic agents, acting by a stimu-

lant effect; and uniting the effect of No. 11 with the peculiar effect of the fluid employed.

32. Sanguineous Evacuants.

General Depletives, operating by a primary and secondary effect towards the same issue.

The abstraction of blood from the body is a therapeutic mean of the highest importance. It is accomplished by different operations of an artificial or natural kind; and according as these are so conducted as to affect the general system primarily, by immediately evacuating the blood from vessels directly in the course of circulation; or secondarily by liberating it from superficial vessels remotely connected with the circulation: blood-letting is called *general* or *topical*.

Sanguineous evacuants may be thus classed:

1. Blood-letting by venesection.
2. ——————— by arteriotomy.
3. ——————— by slackening the ligature of the umbilical chord, or by severing it by scissors or scalpel. before the ligature has been applied.
4. ——————— by cupping and the scarificator.
5. ——————— by scarification with the lancet.

Artificial Operations.

6. ——————— by leaching. { Natural operation artificially used.

The first and fourth and sixth means are those ordinarily resorted to. The second is sometimes

necessary. The fifth is employed by surgeons for liberating the inflamed and torpid vessels of the adnata, and other purposes; and the third may save life, in the new born, in certain engorged conditions of the fœtal circulation, arising from causes involved in parturition.

The efficacy of blood-letting generally, in the cure of diseases, will be the subject of a particular discussion in the lectures; and the peculiar cases requiring the different means of producing this evacuation, will be stated.

32. SUPPOSITORIES.

a. Simple.

b. Medicated.

Topical evacuant stimulants, acting when medicated, by the united effect of local irritation of the sphincter ani and the specific determination of the cathartic employed in the medication, to the rectum, and through it on the bowels; when simple, acting as local irritants on the sphincter ani.

33. SWIMMING.

Uniting exercise with bathing.

34. TOPICAL REFRIGERANTS.

Chemical remedies inducing coldness by evaporation.

35. VAPOUR BATHS.

a. Simple.

b. Medicated.

External stimulant Dirphoretics acting by a secondary effect on the general system.

ADVENTITIOUS REMEDIES NOT MEDICAMENTS.

Section 2d,

Belonging to division (C.) of Synopsis at the beginning of these outlines.

1. EXERCISE.

a. Rocking in a rocking-chair, walking in a room, under or without exposure to fresh air.
b. Walking abroad.
c. Swinging.
d. Sailing in rivers or small waters.
e. Sailing at sea.
f. Gestation for a few miles in an easy close carriage, open carriage, in a stage or rough vehicle, by journies in the same.
g. Equitation, journies by this conveyance.
h. Gyration.
i. Dancing the rope, dancing under the exhiliration of music.
k. battle-dore.

2. Manly Sports.

a. Hunting, shooting.
b. Playing at cricket, tennis, nine-pins, quoits, ball and the like.

3. ATHLETIC EXERCICES.
   a. Fencing.
   b. Personal defence by stuffed gloves.
   c. Dum-bells.
   d. Labour, as exercise.

4. GYMNASTICS.*
   Gymnastic Dress; prophylactic agents in their exercises, as the truss.
   a. Running.
   b. Leaping.
   c. Leaping by the pole.
   d. Climbing the ladder.
      the rope-ladder.
      the pole.
      the rope.

* The gymnastic exercises are now more important as therapeutic agents, since establishments are in operation in Europe and this country, for performing them There is one in Boston; and one in this city under the superintendance of Mr. William Fuller, a gentleman every way qualified to conduct it with advantage and propriety. The gymnastic exercises are not only manly and invigorating, but they can be practised in bad weather or under shelter—and when exercise by riding, walking, &c. would be impracticable. Another advantage they afford, is variety; each exercise calling into action a different set of muscles. There is a regular gradation of the exertion required —and the least active and violent feats should first be tried, and in succession, those calling for greater activity and energy. I do not know that the truss has ever constituted a part of the precautionary preparations for their violent exercises—I think however, that a gymnasium should be furnished with several double trusses, to be worn by those of lax habit, during the exercise of leaping and vaulting, at least; and perhaps during those, of running and climbing. The invigoration induced by practice, will sufficiently protect the body from rupture, and then the precautionary truss may be laid aside. Believing as I do that many chronic diseases originate from a want of sufficient exercise, I can recommend the gymnasium, as affording the best prophylactic exercises, particularly in the winter season, which can be had There are cases in which its therapeutic effect, would be beneficial.

e. Vaulting.
f. Darting the javelin.
g. Exercise on the bars.
1. Horizontal bar.
2. Parallel bar.
h. Hauling the rope.

ADVENTITIOUS REMEDIES NOT MEDICAMENTS.

Section 3d,

Belonging to division (B) of Synopsis beginning these outlines.

They are exciting agents, operating therapeutically on the mind and body--through moral agency.

1. Public Amusements.

Social intercourse with friends; the theatre; equestrianism; miscellaneous sights, or as the French term them '*spectacles*'—The peculiar moral effect of tragedies, comedies, operas, farces and pantomimic exhibitions enquired into.

2. Exercise of the Lungs.

a. Reading Aloud.
b. Declaiming.
c. Singing.
d. Practice on musical instruments—all uniting a moral influence with a physical exercise.

Section 4th,

Prophylactic agents belonging to division (D) of the Synopsis beginning these outlines.

a. Natural agents.
b. Bodily evacuations.
c. Natural rest,
d. Celibacy.
e. Marriage.

Section 5th,

Belonging to the same division (D).

Moral agents unaccompanied by bodily exercise.
a. The exhilarating emotions and enlivening passions.
(The details. and illustrations in the lectures.)
b. Rarely. but sometimes. the depressing passions.
(Details and illustrations in the lectures.)

RESTORATIVE DIETETICS.

Belonging to division (E) of the Synopsis preceding these outlines.

This division I substitute in place of the materia alimentaria which Cullen, Darwin, Barton and other writers have considered a part of Materia Medica; under the head E in the synopsis, the outlines of this subject are given: I therefore have only to enumerate the individual substances in the lecture, and endeavour to point out their peculiar properties and effects in relation to each other; and

then proceed to notice briefly those of the remedies belonging to Materia Medica proper, not medicaments—which have not been already sketched in the preceding outlines.

Detail of the relative portions of the articles of Materia Medica from the vegetable, mineral and animal kingdoms.

The Pharmacopia of the United States contains in its two lists 292 simple medicinal articles—of these

236 are Vegetable.—*Botany.*
44 — Mineral.—*Mineralogy.*
5 — Animal.
2 — From the sea.
5 — Insect tribe.—*Entomology* } *Zoology.*

The Materia Medica of Cullen (a standard work) contains under different heads or classes, 480 articles and compounds—of these

310 are Vegetable.—*Botany.*
29 — Mineral.—*Mineralogy.*
89 — Animal
2 — Insect tribe.—*Entomology.* } *Zoology.*

Dyckman's edition of the Edinburg Dispensatory contains under its various heads, 2088 articles and compounds—of these

1372 are Vegetable.—*Botany.*
619 — Mineral.—*Mineralogy.*
41 — Animal.
17 — From the sea.
39 — Insect tribe.—*Entomology.* } *Zoology.*

Thatcher's Dispensatory contains 1037 articles and compounds under its various heads—of these

668 are Vegetable.—*Botony.*
332 — Mineral.—*Mineralogy.*
15 — Animal.
8 — From the sea.
14 — Insect tribe—*Entomology.* } *Zoology.*

Eberle's Elements of Materia Medica, and Therapeutics, contains under its various heads, 342 articles and compounds—of these

211 are Vegetable.—*Botany.*
120 — Mineral.—*Mineralogy.*
6 — Animal.
5 — Insect tribe.—*Entomology.* } *Zoology.*

Chapman's Elements of Materia Medica, and Therapeutics contains under its different heads, 198 articles and compounds—of these

108 are Vegetable.—*Botany.*
81 — Mineral.—*Mineralogy.*
3 — Animal.
6 — Insect tribe.—*Entomology.* } *Zoology.*

Having sketched the outlines of the divisions A. B. C. D. E. I have yet to notice the next division, viz:

TOXICOLOGY.

Belonging to division (F) of the Synopsis preceding these outlines.

This is the history of the substances and agents, effects, and curative, neutralizing, resisting, or expelling means of poisons—I shall divide the subject into:

a. Natural and chemical history of poison.
b. Incompatible substances, with poisons.
c. Effects.
d. Symtomatology, by which those effects are known.
e. Antidotes.

INCOMPATIBLES.

As pertaining to Toxicology which cannot be studied without a knowledge of the incompatible substances of the Materia Medica, I subjoin an alphabetical exposition of these, according to their English names. The following pages of incompatibles are the bases of toxicological practice: besides which they contain what it is essential the student should know, to enable him to write consistent prescriptions, the ingredients of which may, by avoiding incompatible substances, be co-operative, and not antagonizing, neutralizing or decomposing. It will be expected that candidates for a degree will be well prepared on the subject of incompatibles.

Acetate of Lead, (sugar of lead) *Plumbi Acetas*, is incompatible with

Sulphuric Acid.
Muriatic Acid.
Carbonic Acid.
Citric Acid.
Tartaric Acid.
Potass.
Soda.
Ammonia.
Muriate of Soda.
Liquor Ammoniæ Acetatis.
Lime Water.
Carbonate of Lime.
Sulphate of Lime.
Solution of Sulphuretted Hydrogen.
Hard Water, usually.

Acetated Liquor of Ammonia, *Ammoniæ Acetatis Liquor*, is incompatible with

Acids.
Potass.
Soda.
Subcarbonate of potass.
Subcarbonate of Soda.
Lime Water.
Magnesia.
Sulphate of Magnesia.
Oxymuriate of Mercury.
Sulphate of Iron.
——— Copper, and
——— Zinc.
Nitrate of silver.
Acetate of Lead.
Subacetate of Lead.
Super-acetate of Lead.

Acetate of Potash, *Potasæ Acetas*, is incompatible with

Sulphuric,
Muriatic, and
Nitric Acids.
Sulphate of Soda, and
——— Magnesia.
Most Metallic Salts.
Most Earthy Salts.
Most Acids.
Most Acidulous Salts.
Lime Water.
Muriate of Lime.
Salts of Lead.
Salts of Silver.

Ammoniated Copper, *Cuprum Ammoniatum*, is incompatible with

Acids.
Potass.
Soda.
Lime Water.

Angustura Bark, *Cuspariæ Cortex*, is incompatible with

Tartar Emetic.
Muriate of Mercury.
Nitrate of Silver.
Sulphate of Iron.
———— Copper.
Acetate and super-acetate of Lead.
Pure Potass.
Infusion of Galls.
————Yellow Cinchona.

Aromatic Confection, *Confectio Aromatica* is incompatible with

Acids of all kinds.

Aromatic Spirit of Ammonia, *Spiritus Ammoniæ Aromaticus*, is incompatible with

Acids.
Acidulous Salts.
Earthy Salts.
Lime Water.
Metallic Salts.

Ammoniated Iron, *Ferrum Ammoniatum*, is incompatible with

Alkalies.
Alkaline Carbonates.
Lime Water.
Astringent Vegetable bodies.

Ærugo,

Vinegar converts it into a soluble acetate, and ought not therefore to be employed as an antidote to its poison—Sugar exercises a chemical action on it, by which its solubility in the human stomach is diminished, and is therefore a specific against its deleterious consequences.

Balsam Copæiva, is incompatible with

Sulphuric Acid.
Nitric Acid.

Berries of Capsicum, *Capsici Baccæ*, are incompatible with

Corrosive Sublimate.
Acetate of Lead.
Nitrate of Silver.
Sulphate of Iron.
———————Zinc.
———————Copper.
The Carbonates of Alkalies.

Calomel, *Hydrargyri Submurias*, is incompatible with

Potass.
Soda.
Ammonia.
Alkaline Carbonates.
Hydrosulphurets.
Lime Water.
Iron.
Lead.
Copper.

T

Calumba Root, *Calumbæ Radix*, is incompatible with

Acetate of Lead.
Super-acetate of Lead.
Infusion of Galls.

Camphor Mixture, *Mistura Camphoræ*, is incompatible with

Camphor.
Sulphate of Magnesia.
Several Saline Bodies.
All which separate the camphor from the water.

Carbonate of Magnesia, *Magnesiæ Carbonas*, is incompatible with

Acids.
Acidulous Salts.
Alkalies.
Neutral Salts.
Cream of Tartar.
Nitrate of Silver.
—— —— Mercury.
Corrosive Sublimate.
Super-acetate of Lead.
Fixed Alkalies and their Carbonates.
Lime Water.

Carbonate of Soda, *Sodæ Carbonas*, is incompatible with

The same as those of Sodæ Subcarbonas.

Carbonate of Potash, *Potassæ Carbonas*, is incompatible with

The same substances as Potassæ Subcarb. except
Sulphate of Magnesia.
Calomel, unless heated.

Chammomile Tea, *Infusum Anthemidis*, is incompatible with

Salts of Iron.
——— Mercury.
——— Silver.
——— Lead.
Isinglass.
Infusion of Cinchona

Citric Acid, *Acidum Citricum*, incompatible with

Nitric and Sulphuric Acids.
Alkaline Solutions.
——— Sulphates.
——— Carbonates.
——— Tartrates.
Soaps.
Earthy Carbonates.
Acetates, particularly of Mercury and Lead.
Metallic Carbonates.

Calcis Muriatis Liquor.

Same as with Calcis Murias.

Cinchona, is incompatible with

Sulphate of Zinc.
Nitrate of Silver.
Tartar Emetic.
Common Sublimate.
Salts of Iron.
Solution of Arsenic.

Clove Tea, *Infusum Caryophyllorum*, is incompatible with

Lime Water.
Solutions of the Preparations of Iron.
Ditto of Zinc.
Ditto of Lead.
Ditto of Silver.
Ditto of Antimony.

Cochineal, *Coccus*, is incompatible with

Acetate of Lead.
Sulphates of Zinc and Iron.

Colchicum,

Acids and oxygenating substances render the vinous infusion drastic—alkalies render it mild by increasing its solubility in the stomach.

Colocynth, is incompatible with

Acetate and Super-acetate of Lead.
Sulphate of Iron.
Nitrate of Silver.
Fixed Alkalies.

Compound mixture of Iron, *Mistura Ferri Compositum*, is incompatible with

Acids and acidulous Salts which dissolve the Proto-carbonate of Iron.
Vegetable Astringents.

Compound Decoction of Aloes, *Decoctum Aloes Compositum*, is incompatible with

Acids.
Acidulous Salts.
Earthy Salts.
Metallic Salts.
All substances which are decomposed by, or which decompose Subcarbonate of Potass.

Compound Infusion of Senna, *Infusum Sennæ Compositum*, is incompatible with

Strong Acids.
Lime Water.
Most metallic Salts.

Compound Infusion of Roses. ***Infusum Rosæ Compositum,*** **is incompatible with**

Alkalies.

Earths and all substances which combine with Sulphuric Acid, or are acted upon by small quantities of it.
Acetate of Lead.
Sulphate of Iron.

Compound Infusion of Gentian. ***Infum Gentianæ Comp.*** **is incompatible with**

Solution of Acetate of Lead.
——— Sulphate of Iron.

Compound Infusion of Flaxseed. ***Infusum Lini Compositum*** **is incompatible with.**

Alcohol.
Preparations of Lead.
——— Iron.
Most metallic Salts.
Muriated tincture of Iron.

Compound camphorated liniment. ***Linimentum camphoræ comp.*** **is incompatible with**

Acids.
Water.

Compound Infusion of Catechu. ***Infusum Catechu Compositum,*** **is incompatible with**

Sulphate of Iron.
Tartar Emetic.
White Vitriol.
Corrosive Sublimate.
Strong Acids.
Solution of Isinglass.
Infusion of Cinchona.

Compound Infusion of Horse Radish, *Infusum Armoraciæ Comp.* is incompatible with

Alkaline Carbonates.
Salts of Silver.
——— Mercury.
Infusion of Galls.
——— Cinchona.

Corrosive Sublimate, *Hydrargyri Oxymurias*, is incompatible with

Potass.
Soda.
Ammonia.
Carbonate of Potass.
——— Soda.
——— Ammonia.
Sulphuret of Potass.
All Hydrosulphurets.
Soap.
Lime Water.
Many Metals.
Tartarized Antimony.
Nitrate of Silver.
Acetates of Lead.
Infusion of Bitter Vegetables.
——— Astringent Vegetables.
Mortass of glass, as earthen ware, should be used for dispersing medicines containing this salt.

Dandelion root, *Radix Taraxaci*, is incompatible with

Corrosive Sublimate.
Sulphate of Iron.
Human Caustic.
Super-acetate of Lead.
Infusion of Galls.

Decoction of Qince Seed, *Decoctum Cydoniæ*, is incompatible with

Acids.
Alcohol.
Most metallic Salts.

Decoction of Oak Bark, *Decoctum Quercus*, is incompatible with

Alkaline Solutions.
Most metallic Salts.
Solutions of Isinglass.
Decoction of Yellow Bark.

Decoction of Sarsaparilla, *Decoctum Sarsaparillæ*, is incompatible with

Lime Water.
Acetate of Lead.

Decoction of Slippery Elm, *Decoctum Ulmi*, is incompatible with

Alcohol.
Tinctures in any considerable quantities.

Dried Alum, *Alumen Exsiccatum*, is incompatible with

Alkalies.
Carbonates of Alkalies.
Tartrate of Potass.
Lime.
Lime Water.
Magnesia.
Carbonate of Magnesia.
Acetate of Lead.

Epsom Salt, *Magnesiæ Sulphas*, is incompatible with

Potass.
Soda.
Ammonia.
Subcarbonate of Potass.
——————— Soda.
Lime Water.
Muriate of Lime.
Acetate of Lead.

Extract of Opium, *Extractum Opii*,

Carbonate of Potass.
Muriate of Mercury.
Sulphate of Zinc.
——————Copper.
Acetate of Lead.
Nitrate of Silver.
Solution of Astringent Vegetables.

Extract of Poppies. *Extractum Papaveris*, is incompatible with

The same as Extract of Opium.

Flowers of Zinc, *Zinci Oxydum*, is incompatible with.

Acids.
Acidulous Salts,
Alkalies.

Fœtid Spirit of Ammonia. *Spiritus Ammoniæ Fœtidus*. is incompatible with

The same as in Spirit. Ammoniæ. Arom.

Fowlers Solution, *Liquor Arsenicalis*, is incompatible with

Acids.
Acidulous Salts.
Lime Water.
Muriate of Lime.
Sulphate of Magnesia.
Alum.
Sulphate of Iron.
Muriate of Lime.
Nitrate of Silver.
Sulphate of Copper.
Sulphuretted Hydrogen and its compounds.
Decoction of Cinchona.

Henbane leaves, *Hyosyamus Foliæ*, is incompatible with

Super-acetate of Lead.
Nitrate of Silver.
Sulphate of Iron.

Hemlock Leaves, *Conii Folia*,

Its power is greatly diminished by vegetable acids; hence vinegar is the best antidote for its poison.

Infusion of Quassia, is incompatible with

Lunar Caustic.
Super-acetate of Lead.

Infusion of Orange Peal, *Infusum Aurantii*, is incompatible with

Super-acetate of Lead.
Sulphate of Iron.
Lime Water.
Infusion of Cinchona.

Infusion of Calumba, *Infusum Calumbæ*, is incompatible with

Lime Water.
Acetates of Lead.
Oxymuriate of Mercury.

Infusion of Cascarilla Bark, *Infusum Cascarillæ*, is incompatible with

The same as with Infusum Caryophyllorum and Infusion of Galls.

Infusion of Angustura Bark, *Infusum Cusparіæ*, is incompatible with

Infusion of Catechu and Galls.
Solutions of the Salts of most Metals.

Infusion of Simaruba Bark, *Infusum Simarubæ*, is incompatible with

Decoction of Galls.
Infusion of Catechu.
Alkaline Carbonates.
Lime Water.
Salts of Lead.
——— Silver.
——— Mercury.

Infusion of Digitalis, *Infusum Digitalis*, is incompatible with

Solutions of the Salts of Iron.
Probably those of most other Metals.

Ipecacuhanha root and powder of it, are incompatible with

All vegetable astringents as Infusion of Galls, &c.
Vegetable acids, particularly the acetic, weaken its powers. By exposure to air and light it is deteriorated, and long exposed, becomes inert.

Kino, is incompatible with

The Mineral Acids.
Alkalies and their Carbonates.
Isinglass.
Acetate of Lead.
Nitrate of Silver.
Tartar Emetic.
Super-acetate of Lead.
Sulphate of Iron.
Muriate of Mercury.
Decoction of Galls.
In fact all those substances which decompose tannin.

Laudanum, *Tinctura Opii*, is incompatible with

Potass, and its Subcarbonate.
Soda, and its Subcarbonate.
Ammonia and its Subcarbonate.
Most metallic Salts.
Infusion of Galls.
The solution of opium in water is precipitated by pure ammonia; fixed alkaline carbonates; solutions of corrosive sublimate, lunar caustic; acetate and super-acetate of lead; sulphate of copper zinc and iron, infusion of galls and cinchona.

Lime Water, *Liquor Calcis*, is incompatible with

All Alkaline and Metallic Salts.
Borates.
Tartrates.
Citratey.
Acids.
Sulphur.
Spirituous Preparations.
Infusion of Orange Peal.
——————Calumba.
——————Cinchona.
——————Rhubarb.
——————Senna.

And all other astringent vegetables, carbonic acid throws down a carbonate of lime.

Lime, *Calx*, is incompatible with

Acids.
Acidulous Salts.
Alkaline Carbonates.
Ammoniacal Salts.
Borates.
Metallic Salts.
Astringent Vegetable Infusions.

Liquor ferri Alkalina, is incompatible with

Water.
Vegetable Infusions and Decoctions.
Pure Acids.
Alcohol.
Alkalies.

Liquor of Subacetate of Lead, *Plumbi Subacetatis Liquor*, is incompatible with

Same as Plumbi Acetas.

Liquor of Ammonia, *Ammoniæ Liquor*, is incompatible with

All Acids, Alum, Metallic Salts, in fact with Saline Solutions of most Earths and Metals, except Barytes or Lime.

Liquor of Potash, *Potassæ Liquor*, is incompatible with

Acids.
Acidulous Salts.
Subcarbonate of Ammonia
Acetate of Ammonia.
Muriate of Ammonia.

Preparations of Earths and Metals held in Solution by Acids.
Calomel.
Corrosive Sublimate.

Liquor of Subcarbonate of Potass, *Potassæ Subcarbonatis Liquor*, is incompatible with

The same as with Potassæ subcarb.

Logwood, *Hæmatoxyli lignum*, is incompatible with

Mineral Acids.
Acetic Acid.
Solutions of Alum.
Sulphate of Iron.
———— ————Copper.
Tartar Emetic.
Acetate of Lead.

Magnesia, is incompatible with

The same substances as Magnesiæ Subcarb. except Lime Water.

Mallows, *Malva*, is incompatible with

Liquor Plumbi acetatis and the other salts of lead.

Mercury with Chalk, *Hydrargyrum cum Creta*, is incompatible with

Acids.
Acidulous Salts.

Mucilage of Gum Tragacanth, is incompatible with

Sulphate of Iron and Copper.
Super-acetate of Lead; they precipitate the mucilage.

Mucilage of Gum Arabic, (*Acaciæ Gummi,*) is incompatible with

Strong acids and Alcohol.
Sulphuric Ether.
Compound spirit of Sulphuric Ether.
Tincture of Muriated Iron.
Sub-acetate of Lead.
(Super-acetate of Lead if an alkaline salt be present.)
Volatile Alkali.
Lunar Caustic.
And some Metallic Salts.

Muriatic Acid, *Acidum Muriaticum,* is incompatible with

Alkalies.
Tartrate of Potass.
Sulphuret of Potass.
Most Earths.
—— Oxides.
—— Carbonates of the incompatible oxides.
Tartarized Antimony.
Tartrate of Iron.
Nitrate of Silver.
Solution of Subacetate of Lead.

Muriated Tincture of Iron, *Ferri Muriatis Tinctura,* is incompatible with

Alkalies.
Carbonates of Alkalies.
Lime Water.
Carbonate of Lime.
Magnesia.
Carbonate of Magnesia.
Astringent Vegetable bodies.
Solution of Gum Arabic.

Muriate of Ammonia, *Ammoniæ Murias*, is incompatible with

Nitric Acid,
Sulphuric Acid.
Lime.
Potass and its Carbonate.
Carbonate of Soda.

Muriate of Lime, *Calcis Murias*, is incompatible with

Sulphuric Acid.
Sulphates.
Potass.
Soda.
Carbonate of Potass.
——— Soda.
——— Ammonia.

Musk Mixture, *Mistura Moschi*, is incompatible with

Mineral Acids.
Corrosive Sublimate.
Sulphate of Iron.
Lunar Caustic.
Infusion of Yellow Cinchona.

Nitric Acid, *Acidum Nitricum*, is incompatible with

Alkalies.
Carbonates of Alkalies.
Acetates of Alkalies.
Earths.
Essential Oils,
Compound Spt. of Lavender, if there be much added.
Metals, except Platina and Gold.
Oxides.
Sulphate of Iron.

Solution of Acetate of Lead.
Sulphurets.
Charcoal.
Phosphorus.
Sugar.
Alcohol and spirits.

Nitrate of Silver, *Argenti Nitras*, is incompatible with

Almost all Spring and River Water.
Potass.
Soda.
Carbonate of Potass.
Carbonate of Soda.
Soaps.
Lime Water.
Sulphuric Acid, } and salts containing these Acids.
Muriatic Acid, }
Tartaric Acid, }
Carbonate of Ammonia.
Liquor Arsenicalis.
Sulphuretted Hydrogen.
Hydrosulphurets.
Astringent Vegetable Infusions.

Pomegranate Root, *Granati Cortex*, is incompatible with

Sulphate of Iron.

Potassæ Sulphuretum, is incompatible with

Acids which combine with Potass and expel Sulphuretted Hydrogen Gas.
Solution of most of the Metals.

Prepared Chalk, *Creta Preparata*, is incompatible with

Acids.
Acidulous Salts.

Precipitated Sulphuret of Antimony, *Antimonii Sulphuretum præcipitation*, is incompatible with

All acids and acidulous salts they increase its emetics properties.

Red Oxide of Mercury, *Hydrargyri Oxydum Rubrum*, is incompatible with

Acids.
Acidulous Salts.
Sulphuretted Hydrogen.

Red Precipitate, *Hydragyri Nitrico-Oxydum*, is incompatible with

The same as with Hydrargyri Oxydum Rubrum.

Resin and Wood of Guaiacum, is incompatible with

The Mineral Acids.

Rhubarb Tea, *Infusum Rhei* is incompatible with

The stronger Acids.
Metallic Solutions.
Some astringent Infusions,
As cusparia, catechu, cinchona, Galls, &c.

Salix, is incompatible with

Solution of Isinglass.
Alkaline Carbonates.
Lime Water.
Sulphate of Iron.

Soap is incompatible with

Acids.
Acidulous Salts.
Alum.
Muriate of Lime.
Sulphate of Magnesia.
Metallic Salts.
Astringent Vegetables.
Hard Water.

Spiritus Camphoræ, *Tinctura Camphoræ*, is incompatible with

Water which precipitates it.

Spiritus Ammoniæ Succinatus, with

Acids.
Acidulous Salts.
Earthy Salts.
Metallic Salts.

Spirit of Ammoniated Camphor, *Spiritus Ammoniæ Camphoræ* is incompatible with

Water.

Spirit of Nitrous Ether, *Spiritus Ætheris Nitrici*, is incompatible with

Sulphate of Iron.
Tincture of Guaiacum.
Tincture of Camphor.

Squill Root, is incompatible with

Lime Water.
Alkaline Carbonates.
Lunar Caustics.
Acetate of Lead.

Subcarbonate of Soda, *Sodæ Subcarbonas*, is incompatible with

Acids.
Acidulous Salts.
Muriate of Ammonia.
Earthy and Metallic Salts.
Lime Water.

Subcarbonate of Potash, *Potassæ Subcarbonas* is incompatible with

Acids.
Acidulous Salts.
Muriate of Ammonia.
Acetate of Ammonia.
Lime Water.
Muriate of Lime.
Sulphate of Magnesia.
Alum.
Tartarized Antimony.
Nitrate of Silver.
Ammoniated Copper.
Ammoniated Iron.
Tincture of Ammoniated Iron.
Tincture of Muriated Iron.
Sulphate of Zinc.
Calomel.
Corrosive Sublimate.
Acetate of Lead.
Subacetate of Lead.

Subcarbonate of Magnesia, *Magnesiæ Subcarbonas*, is incompatible with

Acids.
Acidulous Salts.
Muriate of Ammonia.
Lime Water.
Metallic Salts.

Subcarbonate of Iron. *Ferri Subcarbonas*, is incompatible with

Acids.
Acidulous Salts.

Subcarbonate of Ammonia, *Ammoniæ Subcarbonas*, is incompatible with

All Acidulous Salts.
Acids.
Potass.
Soda.
Subcarbonate of Soda.
——————— Potass.
Supersulphate of Potass.
Supertartrate of Potass.
Lime.
——— Water.
Solution of Muriate of Lime.
Magnesia.
Sulphate of Magnesia.
Alum.
Solutions of Iron, except of Tartarized Iron.
Sulphate of Iron.
——————— Zinc.
Acetate, Sub-muriate and Oxymuriate of Mercury.
Acetate of Lead.
Subacetate of Lead.
Superacetate of Lead.

Sulphate of Potash, *Potassæ Sulphas*, is incompatible with

Tartaric Acid.
Barytes Water.
Muriate of Barytes.
Muriate of Lime.
Acetate of Lead.
Subacetate of Lead.

Sulphate of Soda, *Sodæ Sulphas*, is incompatible with

Subcarbonate of Potass.
Solution of Barytes.
Barytic Salts.
Muriate of Lime.
Nitrate of Silver.
Acetate of Lead.
Subacetate of Lead.

Sulphate of Magnesia, *Magnesiæ Sulphas*, is incompatible with

Muriate of Ammonia.
Barytes.
Lime.
Nitrate of Silver.
——— Lime.
Sub-acetate of Lead.
Super-acetate of Lead.
Fixed alkalies and their carbonates, lime-water; these precipitate from it magnesia and the carbonate of magnesia. The volatile alkali forms with it a triple compound precipitating at the same time, a portion of magnesia.

Sulphuric Acid, *Acidum Sulphuricum* is incompatible with

Alkalies.
Alkaline Carbonates.
Some Earths.
Some Earthy Carbonates.
Solution of Muriate of Lime.
Barytic Salts.
Most Metals.
——— Oxides of Metals.
Solution of Acetate of Lead.

Sulphate of Copper, *Cupri sulphas*, is incompatible with

Alkalies and their Carbonates.
Earths and their Carbonates.
Acetate of Ammonia.
Muriate of Lime.
Acetate and Super-acetate of Lead.
Sub-borate of Soda. (Borax.)
Tartrate of Potass.
Nitrate of Silver.
Corrosive Sublimate.
Acetate of Iron,
All astringent vegetable tinctures and infusions.

Sulphate of Iron, *Ferri Sulphas*, is incompatible with

Potass.
Soda.
Ammonia.
Carbonate of Potass.
Carbonate of Soda.
Barytes.
Salts of Barytes, and
—— Strontia.
Strontia.
Lime Water.
Muriate of Lime.
Soaps.
Nitrate of Silver.
Acetates of Lead.
Astringent Vegetable bodies.

Super-sulphate of Potash, *Potassæ Supersulphas*, is incompatible with

Alkalies.
Earths.
Carbonates of Earths.
Most Metals.
—— Oxides.

Tamarinds, *Tamarinda Pulpa*, is incompatible with

Tartrites and Acetates of Potass and Soda.
The resinous Cathartics.
Infusion of Senna.

Tartar Emetic, *Antimonium Tartarizatum*, its solution is incompatible with

Alkalies.
Alkaline Carbonates.
Some Earths.
Lime Water.
Muriate of Lime.
Some Metals.
—— Oxides of Metals.
Acetates of Lead.
Infusions of Cinchona.
———— Rhubarb.
———— Catechu.

Tartarized Soda, *Soda Tartarizata*, is incompatible with

Most Acids.
Most Acidulous Salts, except Supertartrate of Potass.
Barytic Salts.
Salts of Lime.
Acetate of Lead.
Subacetate of Lead.

Tartaric Acid, *Acidum Tartaricum*, is incompatible with

Alkalies.
Carbonates of Alkalies.
Salts of Potass.
Most Earths.
—— Carbonates of Earths.
Salts of Lime.
—— —— Lead.

Tincture of Guaiacum. *Tinctura Guaiaci*, and Volatile Tincture of Guaiacum. *Tinctura Guaiaci Ammon:* are incompatible with

Oxymuriatic Acid.
Nitrous Acid.
Spirit of Nitrous Ether.

Tincture of Ammoniated Iron, *Ferri Ammoniati Tinctura*, is incompatible with

The same as with Ferrum Ammoniatum.

Tormentil Root, *Radix Tormentillæ*, is incompatible with

Solution of Isinglass.
Salts of Iron.
Alkalies.
Alkaline Earths.

Valerian Root, is incompatible with

The Salts of Iron.

Wine of Iron, *Vinum Ferri*, is incompatible with

The same as Ferri Muriatis Tinctura.

White Vitriol, *Zinci Sulphas*, is incompatible with

Alkalies.
Alkaline Carbonates.
Lime Water.
Hydrosulphurets.
Astringent vegetable Infusions.

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